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MAY 10 1919

AUTOMOTIVE INDUSTRIES

The AUTOMOBILE

Vol. XL
Number 19

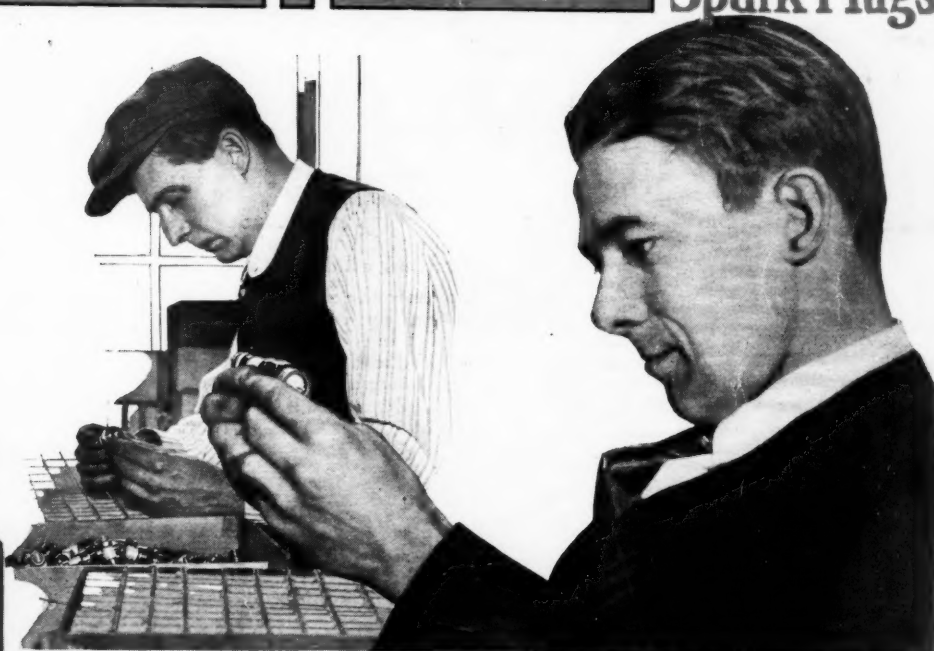
PUBLISHED WEEKLY AT 139 WEST 39th STREET
NEW YORK, MAY 8, 1919

Fifteen cents a copy
Three dollars a year

Champion Dependable Spark Plugs



Champion X
For Ford Cars
A19, Price 90c



Rigid Inspection Insures Dependability

The success dealers have with Champion Spark Plugs is due in a large measure to the rigid final inspection in our factory.

Long trained experts go over the plugs to make sure that every detail is right, and that there are no imperfections.

This care and thoroughness, coupled with our No. 3450 Champion Insulator and our patented

asbestos gasket construction, are responsible for the better performance of Champion spark plugs as compared to other plugs, and their greater resisting power to temperature changes and to shock and vibration.

Now is the time for dealers to make sure their stock of Champion Spark Plugs is complete. Go over your stock today.

Champion Spark Plug Company, Toledo, Ohio
Champion Spark Plug Company, of Canada, Ltd., Windsor, Ontario

TAKING THE BLUE SKY OUT OF ADVERTISING

Brass Tacks on Circulation



Publishers have always been precise as to the exact amount of white space exchanged for any given amount of money. But publishers have often been hazy as to the amount of circulation sold, although the advertiser has been insistent that he was buying readers rather than agate lines.

As a result of federal action, forcing sworn statements from owners of daily newspapers, it is now almost universally possible to secure definite information from newspapers as to total circulation. The Audit Bureau of Circulations has carried this a step farther by separating city, suburban and country circulation for its 630 member newspapers. With this most publishers are content to stop—but not The Chicago Tribune.

Location of Readers

The Chicago Tribune has gone far beyond any other publication in the United States in furnishing its advertisers with definite, accurate information as to its readers—their number—their location—their purchasing power—their buying habits.

The Tribune can tell an advertiser precisely how much circulation he is buying in any section of this tremendous metropolis, the total number of families in that section, their nationality, their buying habits, the number and character of retailers which cater to them, etc.

Out-of-town circulation of The Tribune has been similarly analyzed, so that the advertiser may know how many Tribunes are sold within 40 miles of Chicago, within 100 miles, within 200 miles, within 300 miles.

Other tabulations show the number of Tribunes sold by cities, by counties and by states. The tabulation of circulation by counties has been reduced to graphic form in a dot map, which enables one to determine at a glance the density of Tribune circulation at any point in The Chicago Territory.

Character of Readers

The advertiser has a right to know not only how many readers, but what character of readers. The Tribune has undertaken to answer this question not only for Chicago, but for its entire territory.

Men have been sent to various towns and cities with lists of Chicago Tribune subscribers. They have gone to various sources

of information to learn the identity of these Tribune readers.

The resulting tabulations have shown conclusively that from Oshkosh, Wis., to Montezuma, Ind., and Red Oak, Ia., The Chicago Tribune is read by the bankers, merchants, manufacturers, wholesalers, executives, and the more progressive farmers, clerks and mechanics. In each community the list of Tribune subscribers has been found a veritable directory of the people of wealth, influence and education.

Buying Habits of Readers

Personal investigation by a large staff of trained men threw much light upon the buying habits of Tribune readers in Chicago. Questionnaires have been sent to Tribune readers in other towns to ascertain their attitude toward Tribune advertising and allied facts.

A questionnaire to subscribers in Illinois, Indiana, Iowa, Michigan and Wisconsin, for example, indicated that 63% of the readers of The Chicago Tribune visit Chicago once a year or oftener. Of those who had visited Chicago 76% noted having purchased women's clothing during their visits, 68% men's clothing, 39% rugs and carpets, 38% furniture, 39% books, 13% office equipment, 11% trucks and autos.

Forty-five per cent of those who answered this questionnaire stated that they were accustomed to read clothing advertisements in The Chicago Tribune, 40% listed themselves as habitual readers of Tribune financial advertising, 24% of book advertising, 33% of automobile advertising, 32% grocery advertising.

WRITE FOR THE 1919 BOOK OF FACTS

The Chicago Tribune

THE WORLD'S GREATEST NEWSPAPER

More Than 400,000 Daily and 700,000 Sunday

AUTOMOTIVE INDUSTRIES

The AUTOMOBILE

VOL. XL

NEW YORK—THURSDAY, MAY 8, 1919—CHICAGO

No. 19

Airplane Supply System of the American Army in France

How 46 Complete Flying Squadrons Were Organized, Equipped and Maintained

By W. F. Bradley

PARIS, April 20—Having decided that the military might of Germany should be smashed, it appealed to the imagination of the American citizen to drive home the most crushing blow by way of the air. Probably, when that resolution was taken, the great majority of the people of the United States never realized how difficult, how complicated, how full of unseen obstacles was the program they had placed before them.

The business of raising soldiers is as old as the world, and although the Kaiser and his advisers believed they had surpassed all possible competitors in this branch of activity, England first demonstrated that a healthy young manhood can be transformed into an armed force in a few short months, and the American nation on coming into the fray still further demonstrated this fact. There may be military tradition behind the Kaiser's troops, but they have had to admit themselves crushed and defeated by men who put on the uniform with no other object than to get rid of a bully.

The creation of an aerial army brings up problems of

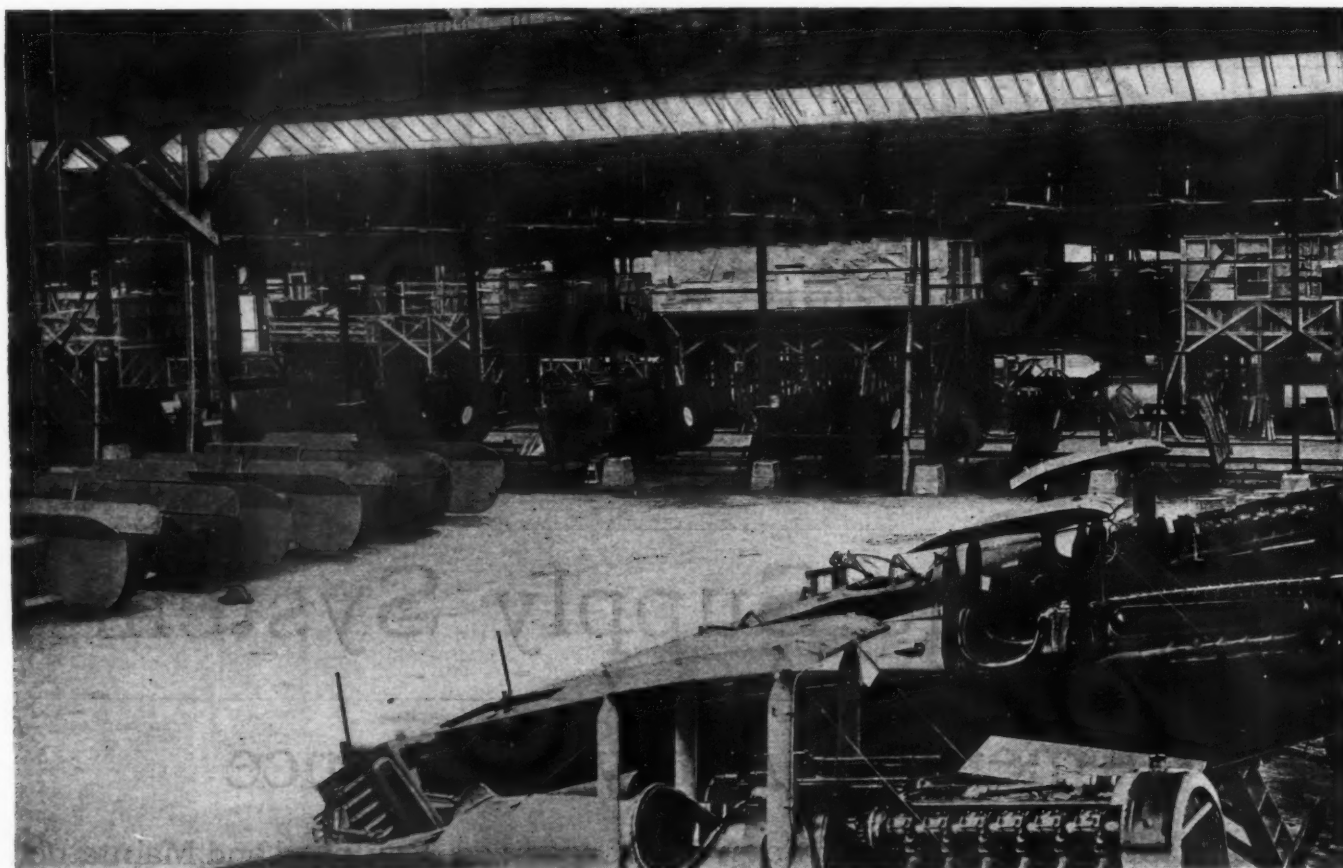
an entirely different order. Teaching an army to fly is in itself a big job; but it is not by any means the biggest. A flyer needs an airplane, and America possessed none; an airplane needs an engine, and America had never built any. An airplane built to-day is out of date six months hence, so far as military operations are concerned.

ACHIEVEMENTS OF AMERICAN AIR SERVICE

Starting right at the bottom of the ladder, with no personnel, little accumulated experience, no formulated organization, the Supply Section of the Air Service had provided for all the wants of an active air force composed of 2017 flying officers, 528 ground officers, and 29,774 enlisted men. It had constituted and sent into active service over the lines a total of 46 complete flying squadrons; it had in operation 12 squadrons of all-American planes; it had received 6476 airplanes, of which number 3261 were service planes; it had erected and put into operation, for assembly, repair, and salvage of material, workshops bigger than the largest automobile factories in the United States.

This means that you cannot just sit down and copy the best available, then go ahead and produce them. While you are building you must be working on something which you know will make your present machine look like a back number. When you have got your airplanes it is necessary to learn how to use them. This lesson has to be learned while you are using them. Further, all that was ever known about the military use of airplanes has been learned since the summer of 1914.

Compared with the Allies, the task of the American Air Service was one of compound complication. The real lessons are learned at the front; they are corrected at the rear. And America was separated from the front by a distance of 3000 miles, across which communication was always



The airplane assembly shops at Romorantin on the day of the armistice

slow and often difficult. Despite all these unusual and difficult conditions, the American Army in the field was always furnished with all the aerial supplies it required. On Nov. 11 it could be shown that every requisition of the army had been met, that there was a big supply of machines in reserve to meet urgent calls, and that a huge scheme of supply had been completed which would have permitted of a tremendous increase of the flying forces of the American army.

Exceptional Achievement in One Year

At home the Supply Section of the Air Service, with little accumulated experience, tackled the problem of the aviation engine and in a little more than one year had designed, perfected, and built to the extent of 3,000,000 hp. a successful aviation motor which was operating not

only over the American lines but in planes belonging to the Allied powers. During the same period the total horsepower of steamship engines built in the United States was only a fraction of the total of aviation engines. Yet steam engine production is a standardized and old-established industry, whereas previous to 1917 there was no aviation engine industry in America, and few of the men who ultimately made good in this line had ever seen a modern flying machine or engine.

To appreciate correctly the effort of America to strike at Germany through the air, it is necessary to take a stand in Paris. This may appear to be a deviation from the main track, for the great effort starts away back in the pine forests of Oregon and culminates in the Argonne, the Somme and the Chateau-Thierry district. The American line thrown across the Atlantic and striking the

ORLY FIELD

Airplane Production Center, No. 1

*For Assembling and Equipping Foreign Built
Planes for American Army*

Work begun.....March 31, 1918
First planes dispatched to front...3 weeks later
Highest daily production.....95
Total planes dispatched to American front
up to Nov. 11.....1,800
Personnel of field...323 officers, 2,283 men
Total distance flown by ferry
pilots403,000 miles

ROMORANTIN

Airplane Production Center, No. 2

*For Assembling and Equipping American
Built Planes*

Work begun.....March, 1918
First airplane dispatched....April 18, 1918
Highest daily production.....60
Total planes dispatched May 11 and
Nov. 11.....1,213
Damaged planes received in 8 months...1,184
Planes repaired and redelivered into
service796

French coast at Bordeaux and Saint-Nazaire continues in a northeasterly direction across the center of France, leaving Paris a considerable distance to the north. The headquarters from which the main stream of supply was directed to the American army was established in the town of Tours. Yet the Air Service supply organization abandoned Tours and went over 100 miles further north to the French capital.

French Machines on Original Order Never Delivered

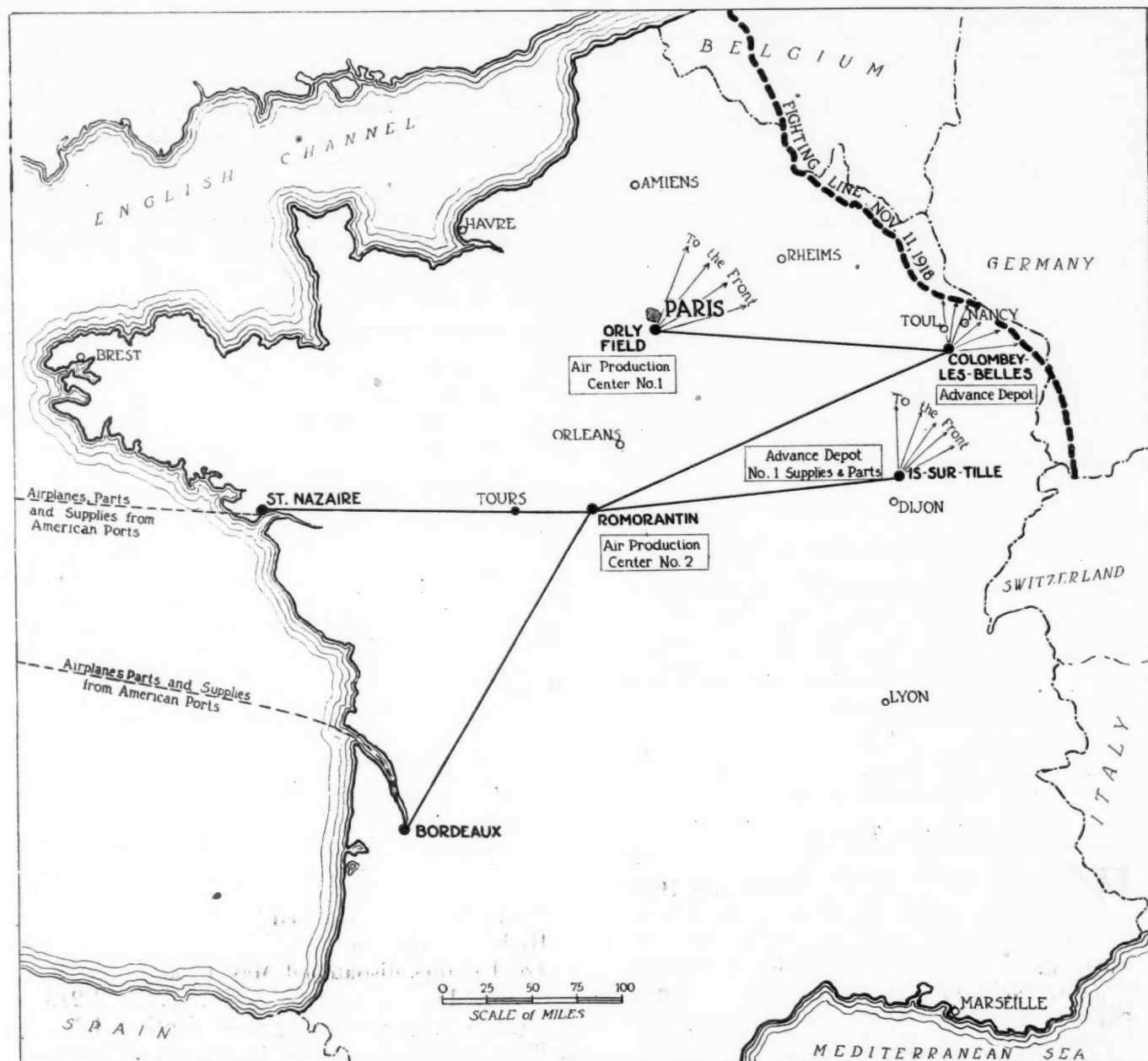
The activities of the American Air Service in France date back to the summer of 1917, when the Bolling Mission arrived in Europe. At that time the American effort was nebulous; it was striving to assume a concrete form, to evolve itself into a powerful working organization. At the end of about three months the Bolling Mission ceased to exist, after having placed a contract in Europe for 5000 airplanes, and having made clear to itself, and probably to the authorities at Washington, the great difficulty of the task of creating a big aerial force.

The 5000 machines France was to supply to the American army never materialized. Nobody is specifically to blame for this, for if America was slow in providing the raw and partially finished material she had to furnish under this contract, the French at that time showed a lack of faith in the American effort. They, who had been through the mill, knew the enormity of the task and were well qualified to estimate the length of time which would be necessary for America to bring an aerial force into existence.

Creating an American Air Force

Meanwhile America was working, but when the year 1918 opened the fact had to be faced that the American program was a long way behindhand, and that practically no supplies were being received from European sources. The mistake had been made at home of overestimating the speed with which an aerial force can be created. There are natural limits to all developments,

(Continued on page 1013)



Map of France, showing how the American army was supplied with airplanes from two production centers, Orly, at which foreign-made machines were assembled, and Romorantin, where the all-American planes were produced. The airplanes were flown from these points to the front through advance depots near the fighting line

Business Needs Leadership and Government Co-operation

Many Problems Unsolved—Centralized Government
Departments Necessary for Foreign Trade—Rail-
roads and Merchant Marine Under Private Owners

THE UNITED STATES CHAMBER OF COMMERCE CONVENTION AT ST. LOUIS

By Allen Sinsheimer

ST. LOUIS, May 1.—Concrete suggestions for return of the railroads to their owners and for sale and distribution of the merchant marine to Americans and positive governmental acknowledgment that the anti-trust laws are antiquated and not in accord with modern business needs were the most important developments of the U. S. Chamber of Commerce convention at St. Louis.

The convention included more than sixty speakers on eighteen major and forty related problems, and the great majority offered problems and acknowledged obstacles to industrial growth, while but few stated concrete recommendations for them. It was a statement heard frequently that either many of the problems do not exist and consequently have no solution, or there is a need for business leaders who can step forward now and guide the nation through its post-war infancy.

That the government must recognize the necessity for new legislation and for greater co-operation with industry because of the after-war conditions was said to be the vital need of business at this time.

Effect of War on American Business

Government action is necessary for new legislation that will fit the new era of our business history and for new departments to meet the new needs of industry.

America's entrance into world trade is producing closer industrial, commercial and diplomatic contact with foreign nations, and new government departments and policies must provide ample assistance to our manufacturers so they can overcome all problems abroad that usually come within the province of government.

That no solution can be found to the problems of business and that they are numerous and each vitally important were other developments of the sessions. Every

WE paid three billion dollars for our Marine during the War. The British Marine cost a little over one billion dollars. The entire Merchant Marine of the World cost two billion dollars. It is absolutely necessary that a considerable portion of the cost of our Marine be written off, if our ship owners are to compete abroad.—HOMER FERGUSON, President, Newport News Shipbuilding Co.

A COUNTRY starting out on the all-tax theory has been taught by experience that it was impossible for them to raise the funds required without recourse to huge loan operations, and then conversely the "all-loan" champions amongst the nations found that it was foolhardy and suicidal to try to finance a war without raising a large portion of its cost by increased taxation.—PAUL WARBURG.

speaker acknowledged that a new era of business history is before the nation, and demanded complete revision of policies, organizations and perspectives from government, capital and labor.

The growth of business and its new standard of higher business ethics must be met by the government with new laws. Combination has been replaced by co-operation and the anti-trust laws of the last century are antiquated, inadequate and obstacles to trade development. The government must recognize this by legislation, approving of co-operative associations for combinations of manufacturers, not for price-fixing or monopoly, but for scientific industrial advancement. It should extend every co-operation to business and cease its interference with business.

That the railroads should be returned to their owners as soon as legislation is enacted that will protect the public, the government and the weaker railroads, was agreed by all speakers, including Walker D. Hines, Director General U. S. Railroad Administration, Senator A. B. Cummins and others.

The American merchant marine must be sold to Americans and on a basis that will insure bottoms for every section of the country requiring them.

Organized labor, it was stated, is here to stay. There must be recognition that a union of labor is as justifiable as a corporation, which is a union of capital. Labor must be regarded as a fellow servant with capital and not as a commercial commodity. Wages are not the only factor in the contentment of labor. Good living and working conditions are equally important and sometimes more so.

Our domestic business and conditions of employment will only be stable if we develop our foreign trade. But we should not look, it was emphasized, to the Allies for

business. They need their own raw material and cannot spare the cash to buy from us. We should look for our largest export trade to South America, the Orient and the European neutral countries. We can only do export business for the next few years with the Allies if we will make investments in private and public enterprises in those countries and accept these as payment for our trade. The Allies cannot buy abroad until they can first develop and re-establish their export trade and sell abroad.

Other important points developed and recommendations made were:

That the government should pay interest on all payments of war contracts that are unduly delayed.

That a comprehensive road construction policy should be formed.

That the Industrial Board for price fixing should be encouraged.

That the Federal Trade Commission should be purely advisory.

That the government should compile a yearly budget and that governmental employees should be selected with regard to their ability to serve industry.

That there should be established a centralized government department to take over the existing fifteen agencies now connected with exports.

That there should be industrial training for labor.

That there should be active participation by commercial bodies for securing employment for returning soldiers.

That the education of the American public to the value of foreign trade, to the importance of making in-

THE government has no justification for attempting to run the business of others until it can run its own business successfully.

—GOVERNOR EDGE, New Jersey.

vestments abroad, and to the reasons why we cannot now look to the Allies for development of our export business should be vigorously carried out.

Resolutions were considered by the convention for appropriation for industrial training, a business cabinet for the President, a centralizing agency for all government bureaus concerned with foreign trade, cost accounting by the government, reorganization of the Federal Trade Commission, continuation of the Industrial Board for price fixing under George Peek, for the payment of interest on overdue government payments, and for new forms of blanks for federal taxation, all of which were referred to the new board of directors of the Chamber for further consideration and action.

Resolutions passed included:

a—Revision of federal laws dealing with business to clearly define rights, limitations and obligations.

b—Employment of soldiers, sailors and marines in the community where they were employed prior to entering the service.

c—New legislation necessary to safeguard our social and business structure during the readjustment from war to peace.

WHAT BUSINESS ASKS OF THE GOVERNMENT

LEGISLATION that will approve of associations of manufacturers into combinations for the purpose of developing and improving industry, which in turn means abolition of such laws as the Sherman Act, which is declared antiquated and not in keeping with the standard of ethics of modern industry.

Reorganization of the Federal Trade Commission to form a larger and purely advisory body.

Sale of American merchant marine to Americans and on a basis that will insure fair distribution of bottoms to every section of the country needing them. Prices of sale to be below the war cost of the ships to allow ship owners to compete with foreign trade.

Modification of sea laws to allow all officers of the American marine to be Americans.

Government subsidy for ship owners if necessary.

Special bureau under Department of Commerce for water transport.

Centralized department that will co-ordinate the work of the fifteen bureaus now handling various details of foreign commerce.

Establishment of Federal Highway Commission, federal appropriations for the construction and maintenance of national highways, federal road building aid for the states beyond 1921, federal approval for road construction when the roads are of a permanent character only.

Compilation of a yearly budget of government expenses and financial condition.

Greater exercise of care in the selection and appointment of government employees who work in bureaus that co-operate with or aid business.

Return of railroads to their owners after Congress formulates legislation providing for a consolidation of railroads into competing combinations comprising both weaker and stronger roads and to protect the public, the government and the owners.

A vigorous, aggressive policy that will enable our exporters to meet and overcome all obstacles abroad whether of a commercial or diplomatic nature.

Revision of laws to clarify them so all manufacturers can know their rights.

COLLECTIVE bargaining is here to stay.
—WILLIAM C. REDFIELD, Secretary of
Commerce.

d—Objection to the entrance of the Government into any field of transportation, communication, industry or commerce or any business that can be successfully undertaken and conducted by private enterprise.

e—The extension of banking and insurance under government supervision to encourage foreign trade

f—Development of a policy for protection of American citizens, enterprises and investments abroad to encourage foreign investment and stimulate export trade.

g—Return promptly of the telegraph and telephone properties to their owners.

h—Creation of a federal highway commission, substantial appropriations for construction and maintenance of a national highway system, continued federal road aid to states beyond 1921 and government approval for highway construction only when the roads are of a permanent type.

i—Development of a comprehensive system of waterways to co-ordinate the waterways and railways of the country.

j—Conservation of the water power resources of the United States.

k—Establishment of a national budget, to be compiled yearly and to simplify government expenditures and provide economy.

l—Power to the President to veto any separate items or provisions contained in an appropriation bill.

That the railroads should not be returned to their owners until legislation to safeguard them has been passed by Congress was urged by Walker D. Hines in a comprehensive speech in which he outlined a definite plan for their return. He agreed, he stated, with the other speakers that it is to the best interests of the nation that the railroads be operated under private ownership.

As a permanent solution to the problem he stated that the railroads should have a fair return on the fair value of their property, and this value must be determined before legislation is passed. With 180 railroad companies operating generally at the same rates regardless of cost of operation and with many earning but 2 per cent and others as much as 10 per cent, it is clear, stated Mr. Hines, that the legislation must provide for protection to the weaker road. Mr. Hines analyzed the subject further.

Five propositions in all enter into the railroad problem: First, the absence of standards of rates, etc.; second, the wide disparity between the weak and the strong roads; third, the absence of any point of contact between the government and the private management; fourth and fifth, the public suspicion of over-capitalization and fear of exploitation.

All of these can be overcome by a compulsory consolidation of the railroads into a few large competitive sys-

YOU can't man the work unless you house the man.—WILLIAM S. MILLENER, Manager, Williamsport, Pa., Board of Trade.

tems with from twelve to twenty combinations in the three great sections of the country, the West, East and South. Each system or combination should combine the strong and weak roads to secure a fair average in the general situation. There should be an official capitalization. There should be arrangements for government representation on the board of each combine. There must be compulsory combination to insure that the stronger roads combine with the weaker ones. A plan of this kind, properly framed by Congress, will allow the return of the railroads to their owners without hardship or loss to the government, the public or the owners.

Union Labor to Stay.

Union labor is here to stay, and the anti-trust laws are antiquated and obsolete and a direct obstacle to the development of American industry, said William C. Redfield, Secretary of Commerce. Business has outgrown the laws intended to control it, he stated. American business of the future will be more co-operative than competitive.

"Nothing is more certain," he said, "than that there has been a great change for the better in the ethics and methods of trade since the anti-trust laws came into being. There are few elements of good in a strictly competitive state of business. If competition is the life of trade, in its extreme form it may also be the death of trade. If we attempt to end monopoly by insisting upon competition we provide that which will itself create monopoly. Laws intended to restrain trade may restrain promotion of trade. There is a new business standard whereby industry and commerce recognize three-fold obligations to the public, to the business itself and to labor, and industry is frankly endeavoring to adjust itself to these and must have government assistance. We cannot keep the new wine of trade in the old bottles of law.

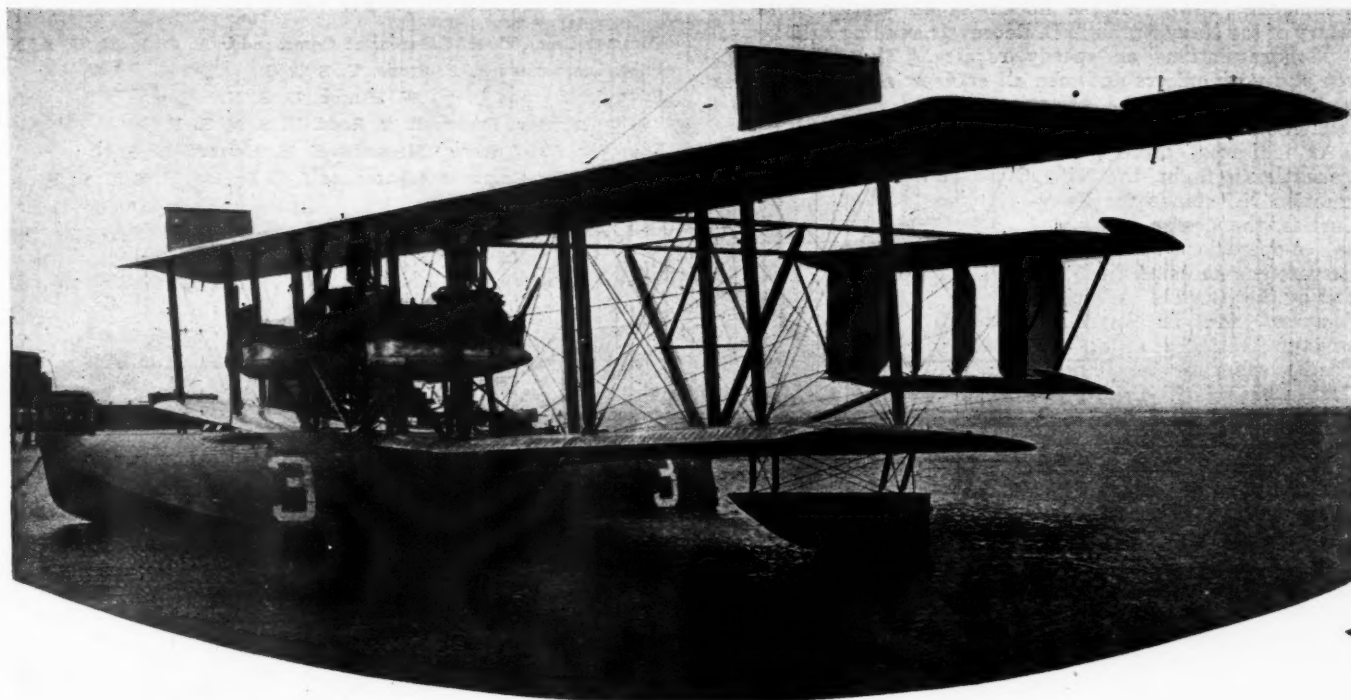
"With the new ethics of trade has come an altered view of labor, now recognized as the fellow servant and not as a commercial commodity. Collective bargaining is here to stay, and a corporation, which is a union of capital, it is now recognized, is no more or less justifiable than a union of labor.

"There is open to us a new course taking advantage alike of the strength of competition and combination and lacking the weakness of both. It is co-operation, within the industry and from the government. We do not have to look very far to see clear signs of the coming of this thing I have called co-operation. The Webb Law

(Continued on page 1022)

THE middleman is the specialized distributor of commodities between the producer and the consumer and his function is a product of normal and natural industrial development. He is a necessary link in the chain which reaches from grower or producer to consumer.—DR. W. F. GEPHART, Washington University School of Commerce.

THE war has brought an understanding of the present immediate need of highways development. The co-operation of towns, counties and states to build roads to form a national highway from coast to coast is needed and will be of the greatest advantage to the community as well as the entire country.—T. M. DUFFEY, Indiana Highway Engineer.



Navy Planes Ready for Ocean Flight

Heavy Head Wind Delays Departure—Fire Damage to Two Machines
Repaired Within 24 Hours—Technical Details of the Planes

ROCKAWAY, N. Y., May 6—Unfavorable weather conditions prevented the start of the three NC flying boats on the first leg of their transatlantic trip which had been scheduled for early this morning with the proviso "weather permitting." A 30.5 mile an hour wind was blowing, and as it was an almost direct head wind it would have greatly retarded the progress of the machines. The distance of this first stage of the proposed route, to Halifax, is only 540 miles, and with a head wind of 30 miles per hour not much over 35 m.p.h. actual flying speed could be counted on, which would have made the time required for the flight 15½ hr. Commander Towers explained that the center of high pressure, which had been at Chicago, and the eastward progress of which they had counted upon to assist them toward St. John's, the final "jumping off point," had moved with much greater speed than expected and any advantage that might have been gained from it was lost. The decision not to make the start to-day was based not only on the weather conditions at the point of departure, but on weather reports from points all along the proposed route which were received via Washington.

A gasoline blaze in the hangar housing the big machines early yesterday morning came near seriously delaying the start of the enterprise. While some of the enlisted men were filling the fuel tanks of one of the machines some gasoline spilled on the floor suddenly caught fire, and the blaze was communicated to the left-hand wings of the NC-1, which were damaged to such an extent that they had to be replaced. While the blaze started suddenly, and no one seems to be able to give a positive explanation of its origin, the supposition is that a spark produced in the wiring or at the commutator of an electric motor used in pumping the "gas" into the tanks of the planes was the cause. The damaged wings of the NC-1 were replaced by the corresponding wings of the NC-2, a machine that has been used mainly in

experimental work and which it was not intended to fly across the ocean. The NC-4 had its tail surfaces damaged by the fire, but the framework of the tail planes was not weakened, hence a repair could be made by simple recovering, which was done with great dispatch.

At dawn this morning the NC-1 was at the water's edge, apparently ready to start off at a moment's notice. The NC-4 was standing some distance back, in the open space between the two immense hangars which have been housing the "transatlantic" planes, and all of its engines were belching flame, evidently undergoing a tuning-up process. The NC-3 was inside one of the hangars and a crew of mechanics was just completing the installation of a new port-side engine, the original engine having developed a loose bearing.

Ocean Flight Planned in 1914

Last night, when it was expected that the start would be made the first thing this morning, one of the newspaper men assembled at the air station put a number of questions to Commander Towers in connection with the proposed trip. To the question as to whether he considered the work in the line of his regular duty, as a patriotic task or as work done in the interest of science, he said that he regarded it as in the nature of special duty. The Navy, which had been planning for the trip since 1914, had launched the enterprise for the scientific and technical data it promised to furnish. Asked as to whether he would want to make a prediction as to the outcome of the trip, Commander Towers said that he had been in the Navy too long to pose as a prophet; however, if the painstaking work of all those who had been engaged in preparing the planes for the long flight counted for anything, the attempt certainly should lead to success.

This morning, just before it was announced that the start would not be made to-day, a telegram was received by

Commander Towers at the Rockaway air station from Secretary of the Navy Franklin D. Roosevelt, reading as follows:

"Congratulations on speedy repairs. The Navy wishes you and your officers and men all success in this first organized effort to cross the Atlantic in air. I wish I were with you. Good luck."

As indicated, three planes have been prepared for the transatlantic flight, the NC-1, NC-3 and NC-4. In this designation NC stands for Navy-Curtiss, the design being due to co-operation between the aircraft engineers of the Navy and of the Curtiss Aeroplane Company, and the machines having been built at the Curtiss experimental plant in Garden City, L. I. Each plane is equipped with 4 high-compression Liberty engines.

The standard crew will consist of five: one commanding officer who will be the navigator, two pilots, one radio operator, and one engineer. An additional member will be carried in the crew of each seaplane as far as Newfoundland, in order that minor mechanical difficulties which might occur in the first part of the trip could be quickly remedied, and, further, to provide a reserve of personnel in case of any sickness among the regular crews, while waiting in Newfoundland for the start.

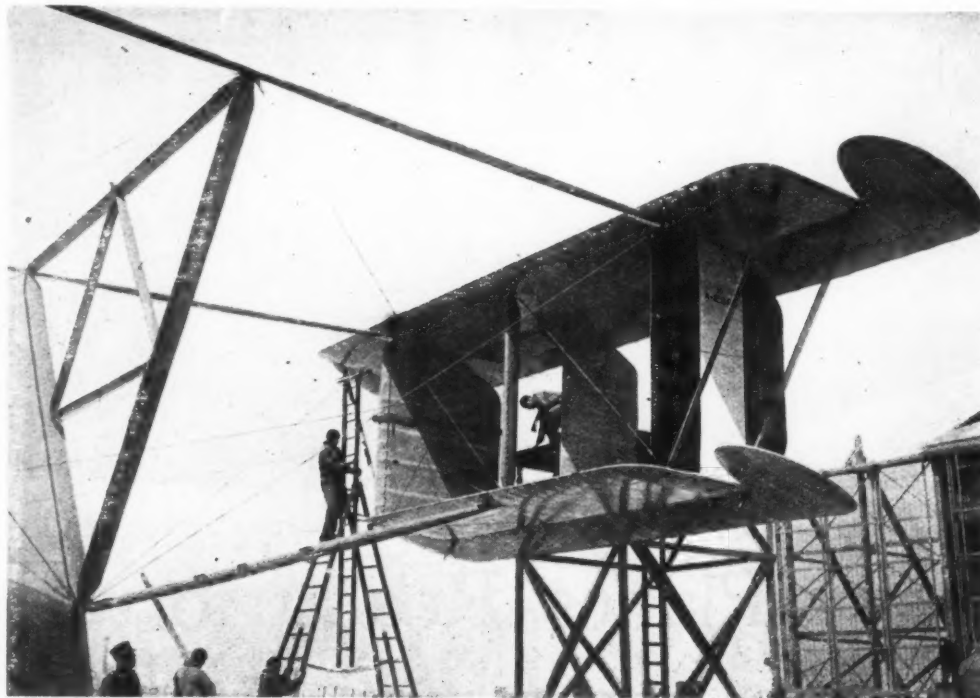
The crews will be as follows:

CREW NO. 1

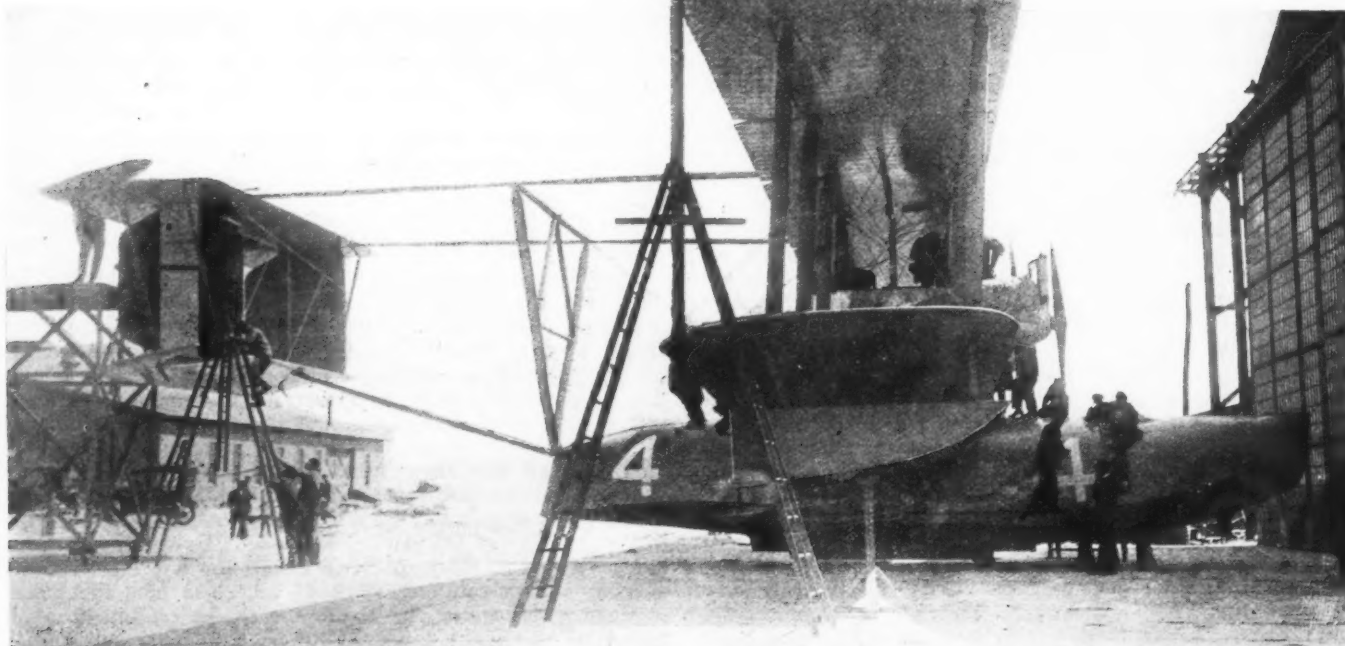
Commanding Officer, Commander J. H. Towers, U. S. N.
Pilot, Commander H. C. Richardson, Construction Corps, U. S. N.
Pilot, Lieutenant D. H. McCullough, U. S. N. R. F.
Radio Operator, Lieutenant Commander R. A. Lavender, U. S. N.
Engineer, Machinist L. R. Moore, U. S. N.
Reserve Pilot Engineer, Lieutenant (J. g.) B. Rhodes, U. S. N.

CREW NO. 2

Commanding Officer, Lieutenant Commander A. C. Read, U. S. N.
Pilot, Lieutenant E. F. Stone, U. S. C. G.
Pilot, Lieutenant (J. g.) W. Hinton, U. S. N.
Radio Operator, Ensign H. C. Rodd, U. S. N. R. F.
Engineer, Chief Special Mechanic E. H. Howard, U. S. N.
Reserve Pilot Engineer, Lieutenant J. L. Breese, U. S. N. R. F.



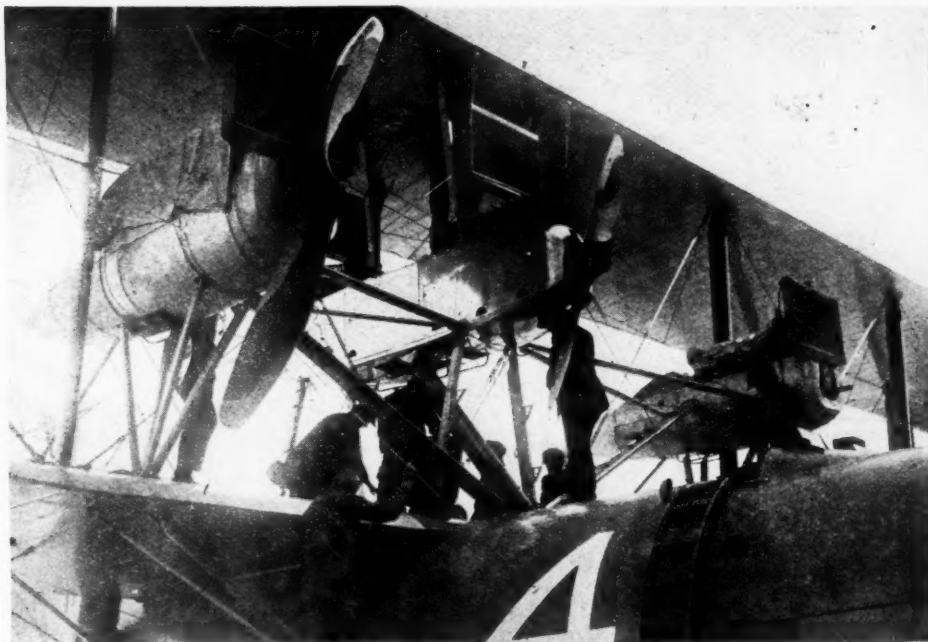
This view shows clearly the immense size of the stabilizer, elevator, tail plane and rudder



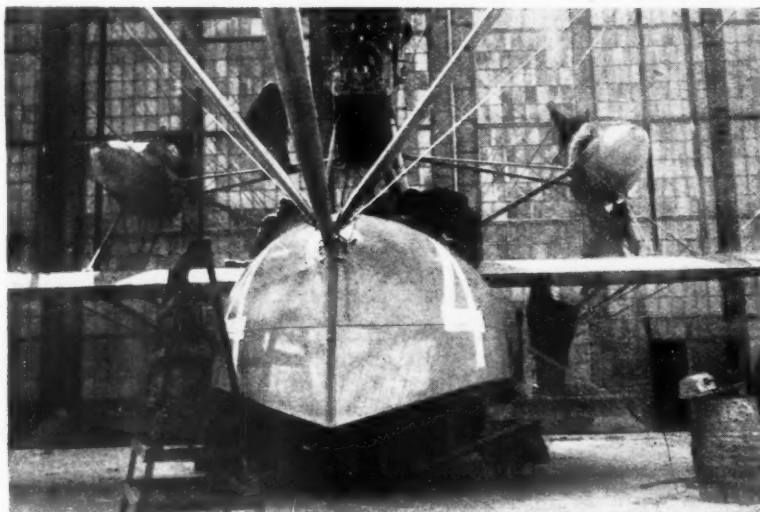
Side view of the NC-4, showing the method of supporting the tail structure from the top wings and hull



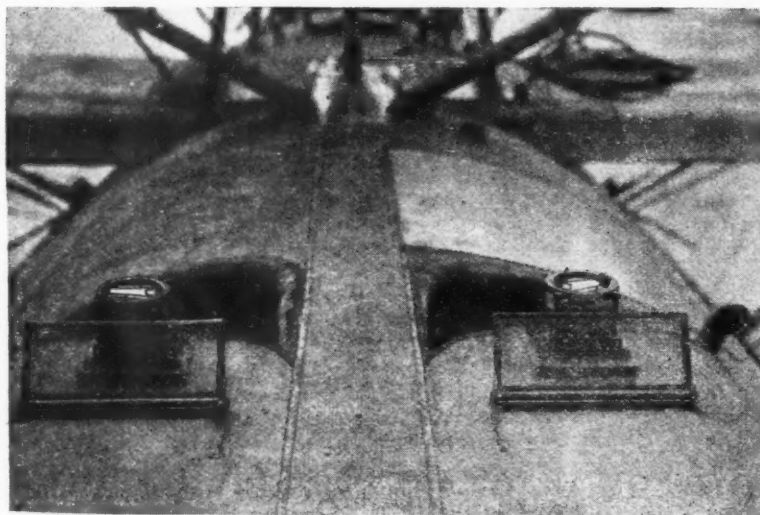
Commander J. H. Towers,
who has charge of the
whole expedition



The four engines are mounted in nacelles which are thoroughly braced
to the wing spars, the hull and to each other



Showing stern end of hull with Vee-shaped keel surface



The two pilots are seated side by side and each has his own
compass

CREW NO. 3

Commanding Officer, Lieutenant Commander P. N. L. Bellinger, U. S. N.
Pilot, Lieutenant Commander M. A. Mitscher, U. S. N.
Pilot, Lieutenant L. T. Barin, U. S. N. R. F.
Radio Operator, Lieutenant (j. g.) H. Sadenwater, U. S. N. R. F.
Engineer, Chief Machinist Mate C. I. Kesler, U. S. N.
Reserve Pilot Engineer, Machinist R. Christensen, U. S. N.

Lieutenant Commander R. E. Byrd, U. S. N., will go in a division commander's seaplane as far as Newfoundland in connection with special navigational experiments, Chief Machinist's Mate E. S. Rhodes will be an extra member of the crew of one of the other seaplanes as far as Newfoundland.

Itinerary of Proposed Flight

As now planned, the trip will end in Plymouth, England, and will be made in five stages. Of this the first stage, from the Naval air station at Rockaway, N. Y., to Halifax, Nova Scotia, measures 540 nautical miles in length; the second stage, from Halifax to Trepassy, Newfoundland, 460 miles; the third stage, Trepassy to Horta, Island of Fayal, Azores, 1200 miles, or to Punta del Gado, Azores, 1350 miles; the fourth stage, Horta or Punta del Gado to Lisbon, Portugal, 750 or 800 miles; the fifth stage, Lisbon to Plymouth, England, 775 miles. The actual transatlantic flight will be from Trepassy, Newfoundland, to Lisbon, Portugal, and no great effort will be made to get to Trepassy as quickly as possible. Whether the stop in the Azores will be made at Horta or Punta del Gado will depend upon weather conditions when these islands are reached. It is figured that an average speed of 65 nautical miles per hour can be maintained, irrespective of wind conditions. Arrangements have been made to have base ships with the necessary gasoline, oil, etc., at the various ports en route, and these ships are provided with special equipment so that refueling can be accomplished quickly.

Some of the chief specifications of the NC boats have already been published in AUTOMOTIVE INDUSTRIES. These machines have a span of 126 ft.



Forward end of hull, showing navigator's pit

from wing tip to wing tip for the upper wings and 114 ft. for the lower, there being a 6-ft. projection of the aileron on each side. The width of the wings is 12 ft.; the gap, 14 ft. at the center and 12 ft. at the outer tips of the lower wings. The overall length from front end to rear end is 68 ft. 3.5 in., while the length of the hull is 44 ft. 9 in.

The weight of the plane, empty, including wireless installation and all navigating instruments, is 15,100 lb., while in flying condition, with full load, the weight is 28,500 lb. This makes the load per unit of wing surface approximately 12 lb. and gives a ratio of useful load to total load of 47 per cent. It is estimated that when carrying full load the boats can develop a maximum speed of 79 nautical miles per hour and at light load 84 nautical miles per hour.

Fuel is stored in 10 tanks, of which 9 are built into the hull and one is in the upper wing above the hull. Each of the tanks in the hull has a capacity of 200 gal., and the gravity feed tank in the upper wing has a capacity of 90 gal., making the total capacity equal to 1890 gal., which is equivalent to 11,400 lb. Disregarding the effect of the wind, this gives a cruising radius of 1476 nautical miles. Lubricating oil to the amount of 900 lb. is stored, and the crew and provisions make up about 1000 lb. of additional load. Each crew consists of 5 men—two pilots, 1 navigator, 1 wireless operator and 1 engineer. The gasoline tanks are of aluminum and the fuel piping is partly of aluminum and partly of copper. The weight of the gasoline system is 6 lb. per gallon of gasoline carried. The engines weigh 825 lb. each and the weight of the empty hull is 2650 lb.

Small Wooden Propellers Drive Gasoline Pumps

The ailerons have an area of 265 sq. ft.; the stabilizers, 267.6 sq. ft.; the elevators, 240.1 sq. ft., and the rudders, 69 sq. ft. The wing tip pontoons weigh 95 lb. each and have a displacement of 1800 lb. each. Small wooden propellers are used for driving the gasoline pumps, and the electric generator used to furnish current for ignition, etc., is driven by the same means. The gasoline pumps are in duplicate, and in addition a hand-operated auxiliary pump is provided. The current from the generator is fed to storage batteries. In addition to furnishing current for ignition the generator also supplies current for operating the wireless set, a complete lighting system for the interior of the boat and for wing tip and tail lights, as well as for lights for night landing. The wireless operator and engineer are located in the main after-compartment just aft of the gasoline tanks. Each is provided with a complete instrument board and each has a cylindrical upholstered stool, with back rest, weighing 5 lb.

complete, within which can be stored the small hand tools required for emergency work.

The pilots are in the hull just forward of the gasoline tanks. Complete sets of instruments are provided, including one compass for each pilot. Flying control is by the dual Deperdussin system, with side-by-side seating. The navigating station is in the front end of the boat hull, and the navigator is provided with a chart board, charts and ordinary navigating instruments, including compass and sextant. A complete wireless installation, including a telegraph, a telephone and a wireless direction indicator, is provided. The sending radius is approximately 300 miles while in the air and 100 to 150 miles while in the water.

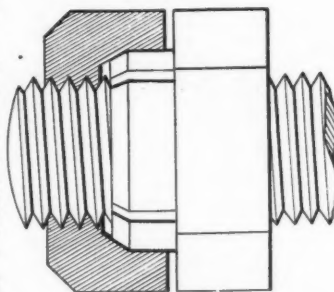
The main structure of the hull and wings is of western spruce, and most of the metal wing fittings and structural fittings are of chrome-vanadium steel, with an ultimate strength 150,000 lb. per square inch. All flying, landing and control wires are standard woven aeroplane cord wire. The wings are covered with linen and are treated with the regular fabric dopes. Streamlining forms of Micarta are used on the wing struts, while the landing and flying wires are streamlined with rubber covered with rubberized fabric. The main keels of the boat hulls are of oak or rock elm, while most of the hull structure is of spruce and the planking of spruce or cedar. The turtle back covering is of cedar or of cotton wood-birch 3-ply veneer.

The Drake Lock-Nut

AN improved lock-nut has been designed by George F. Drake of San Francisco and is being manufactured by the Drake Lock-Nut Co., Cleveland, Ohio. The illustration herewith shows a cross-section of the lock-nut on a bolt, illustrating its principle and application. It will be noted that there is an ample wrench-hold to turn up the nut and pull the work into place. After this has been done, the upper locking member is turned down, and, the contact occurring on a 25 deg. angle at the top of the boss, which is made flexible by slotting, the lower member is securely locked on the bolt at the point of adjustment first obtained, without transferring the load from the lower member to the upper member.

This is explained by the fact that the two members never contact or seat in a horizontal plane at the bottom or top of the boss. The seat or contact occurs on the annular bevel at the top of the boss, and the interior annular bevel in the upper member. The bevel being 25 deg. (and in larger sizes 20 deg.) the radial component of the pressure between the two members will be much greater than the axial component. This results in the flexible fingers of the lower member locking on the bolt without transferring the load already hanging there.

In screwing the lock-nut in place, the corners of the "hex" can easily be matched up. The total height of the Drake lock-nut is said to be equal to that of a standard nut with check-nut. These lock-nuts are made in ¼ to 1-in. S. A. E. sizes, and ¼ to 2-in. U. S. S. sizes.



What Detroit Is Doing To Solve the Housing Problem

Serious Shortage of Homes Is Causing Excessive Labor Turnover—A Situation That Has Become Critical—Community Housing Corporation Organized

SO serious has the housing situation in Detroit become that the city commission, the banks and the big industrial companies are uniting in a vigorous housing campaign. Thousands of houses must be built this summer and rent profiteering must be abolished if the manufacturing interests of the city hope to keep the workingman content with his job. The labor turnover in every plant is reaching a new high mark and is now greater than at any time in the city's industrial history. This, employment officials declare, is more directly due to the home shortage than to any other cause. Hundreds of workers, unable to find proper abode near the scene of employment, are obliged to live from 6 to 10 miles away, and it is only natural, as employment agents point out, that they quit to take jobs in factories nearer home, whenever they get the opportunity.

The Detroit Real Estate Board estimates that there is a shortage of 30,000 homes. Even the rooming houses and hotels are full. One of the larger hotels, which has been in receivership, has just petitioned to have the receivership removed inasmuch as profits during the last few months range from \$10,000 to \$15,000 monthly. Hundreds of men are spending all of their spare time looking for houses or flats without result. Rents on single rooms run from \$4 to \$10 a week. It is almost impossible to get a furnished three or four-room apartment for less than from \$12 to \$15 weekly, while unfurnished homes and apartments range from \$50 a month up. It is estimated that these prices are nearly 50 per cent higher than two years ago.

In direct contrast are conditions at Windsor. While the Canadian city is also suffering from a home shortage, rooms are renting at \$2.50 and \$3, apartments at from \$5 to \$10 weekly, while homes and flats are going at from \$30 to \$35.

It is this situation that is causing Detroit to act to secure immediate relief. While the housing problem is a serious one in every manufacturing center in Michigan and Ohio, in Detroit it has already become critical. Detroit proposes to organize the Community Housing Corporation to finance the construction of 10,000 homes at once. General Motors Corporation will build approximately 2000 dwellings, while Henry Ford is continuing his house-building campaign, both at Highland Park and

Detroit's Housing Problem

A present shortage of 30,000 houses. Rooms and apartments almost unobtainable.

Rents 50 per cent or more higher than a year ago.

Labor turnover at high-water mark.

What Is Being Done

Community housing corporation organized.

Many manufacturing concerns undertaking exterior building operations.

Investigation of rent profiteering.

at Dearborn, on a greatly increased scale. The Gemmer Manufacturing Co., the American Blower Co., the Canadian Bridge Co., D. M. Ferry Seed Co. and the General Necessities Co. are but a few of many companies which propose to build at once.

Mayor James Couzens, former partner of Henry Ford, urges that the Community Housing Corporation conduct its building work on a great enough scale to cover the entire shortage this year. A committee has been appointed to formulate preliminary plans. A. A. Templeton, president of the Board of Commerce, is chairman of this committee. No decision has been reached on its

proposed capitalization, but this will be between \$10,000,000 and \$30,000,000. This capital stock will be absorbed by the large employers of labor. By this arrangement Detroit hopes to centralize its building activities. It is pointed out that the success of the plan hinges on the willingness of large employers to take their profits, not from the actual construction of homes but from the benefits accruing from more contented workmen in homes of their own. The business will be conducted upon a margin of profit just sufficient to furnish a safe surplus.

If the corporation undertakes the construction of only 10,000 homes, an expenditure of at least \$30,000,000 faces the proposed organization. It is argued that a \$1,000,000 corporation, or even one with a capital of \$5,000,000 or \$10,000,000 without some rotating plan based on marketing of mortgages, land contracts or securities representing it, would soon have its entire capital tied up in construction.

For this reason a second organization, the Community Housing Mortgage Corporation, will be formed with a capital stock of \$1,000,000 to engage in buying, selling and otherwise dealing in mortgages and land contracts and other securities arising directly and indirectly from the activities of the Community Housing Corporation. These activities would include dealing in securities, which, not being exclusively the product of the housing corporation, could not be legally handled by that corporation under existing Michigan laws.

The management of the corporation will be placed in the hands of a commission of 15 members, which will select the officers. The new organization will be patterned somewhat along the lines of the Bankers Commer-

cial Securities Corporation, New York City, and the Continental Guaranty Co. of New York and Chicago, both organized by large banking interests in those cities. They have sold more than \$60,000,000 worth of collateral trust debentures.

An Investigation of Rent Profiteering

In the meantime, while these two corporations are being organized to bring the city housing relief, Mayor Couzens is conducting an investigation into exorbitant rentals in Detroit. He has a committee at work and a great deal of data is being collected. He is also going deeply into the legal phase of the affair and is threatening criminal action in certain cases.

There was practically no building work to speak of during the war period. Since the armistice and up to the present time, building operations were greatly curtailed because of the high prices of lumber, steel and other contracting and plumbing supplies. It has just been within the last two months that construction work of all kinds began in earnest. Detroit is just one year behind and nearly every other city in the country is in the same fix.

Industrial conditions here are nearly normal now. There is a demand for nearly everything manufactured in this city and the demand is going to keep the concerns pushed to the production limit for months to come. There is now a shortage of labor. Some companies are already advertising for men in other cities. If the manufacturing situation continues, it will be necessary for the Board of Commerce to conduct an extensive advertising campaign to bring labor to Detroit, and with labor urgently needed, Detroit is facing the extended problem of housing these additional men. There is plenty of work in Detroit but there are no houses and the warm days are going to cause hundreds of tents and temporary abodes to spring up in all the manufacturing districts of the city.

Banking Interests to Assist

The banking interests are now awakening to the true situation. They are relaxing from their "safety first" policy which practically barred a workingman from securing money to build a home. Before the war it was possible for a trustworthy man to go to a bank and receive financial aid. Until a few weeks ago this practice was greatly curtailed. Uncertain business conditions, the unsettled affairs of the peace conference and the high cost of materials, etc., caused the banks to become more cautious than usual and the worker who sought an initial payment for a home was usually asked to wait until mid-summer.

Even the contractors had a hard time getting financial aid. In many sections of the city one will find excavations complete and foundations finished for new homes. Work, however, has apparently been suspended for several months. Investigation usually reveals the fact that the contractor had accepted an initial payment from the prospective owner and started the work, hoping to secure the rest from the bank. When more cash was required, the contractor found that his bank was opposed to financing the project under existing conditions. Thus work stopped until such a time as the money would be available.

There is no question but what the home shortage is hitting industry hard. Men are leaving Detroit in large numbers because there is no place here for their families. Every employment agent in Detroit is thoroughly alive to the situation and the co-operation of the big industries in the proposed municipal housing project is genuine.

What the Gemmer Co. Has Done

The Gemmer Manufacturing Co., maker of automotive parts, is one of the most progressive firms in handling the housing situation. This company, employing 500 men, determined upon the policy of every employee owning his own home, nearly one year ago. It has been pushing the project and aiding its men in every way since. Its method of doing this is being used as a model for other companies.

This company has no set building fund. It merely arranges with its bank to provide Gemmer workingmen with the necessary capital and the company itself guarantees the bank sufficient security to cover the loan. This progressive policy has not cost the company a cent. The company will even go so far as to get the cash for the employee when his personal efforts in this direction might fail. The company works its building program through the Society of Savings, the organization of the Board of Commerce and through the Detroit Real Estate Board. Practically every married man in the Gemmer company's employ owns or is contemplating owning his own home.

At Lansing, Flint, Pontiac and Saginaw conditions are also very bad. The General Motors Corporation is greatly relieving the situation in these cities by its housing program, which calls for the building of hundreds of homes in each place. Akron, O., the rubber center of the nation, has a great home shortage. The situation here is almost as critical as in Detroit. Hundreds of men are walking the streets and sleeping wherever they get a chance. Even single rooms are at a premium. The city has brought 700 contractors in from Philadelphia and a huge building project is under way. It is estimated that at least \$10,000,000 worth of new buildings will be required in Akron alone.

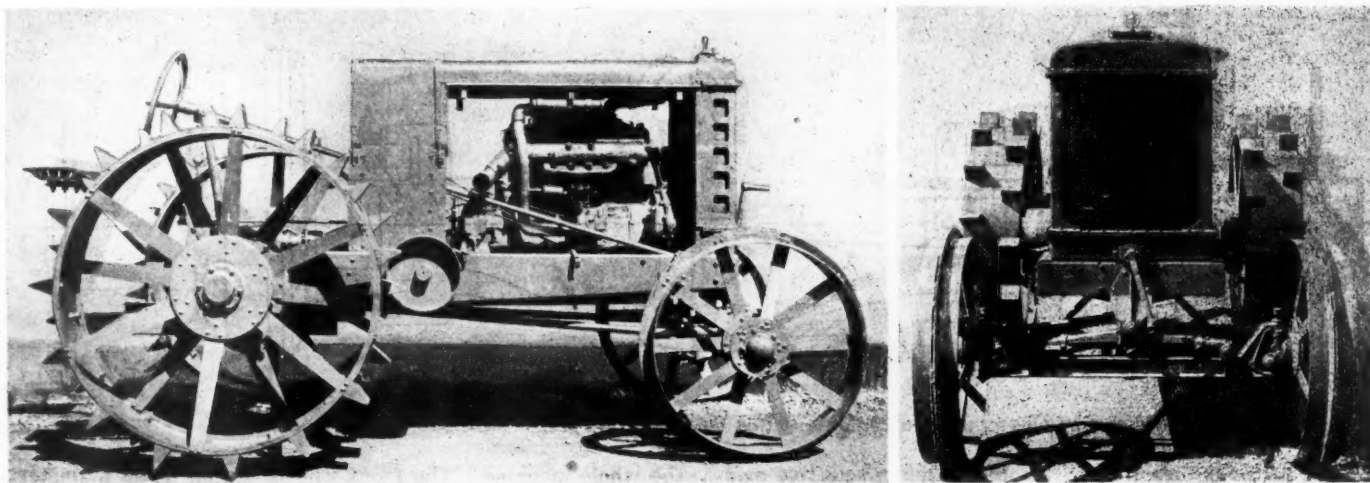
Martinsyde Airplane for the Transatlantic Flight



Major Morgan, who will pilot the Martinsyde across the Atlantic, in conversation with two rival pilots. The photograph was taken at St. John's, Newfoundland

Champion Tractor an Assembled Product

Components Comprise a Buda Engine, Fuller Transmission and Chicago Rear System—Designed with a View to Elimination of Unnecessary Weight and Ready Accessibility of Parts



Side and front views of Champion tractor

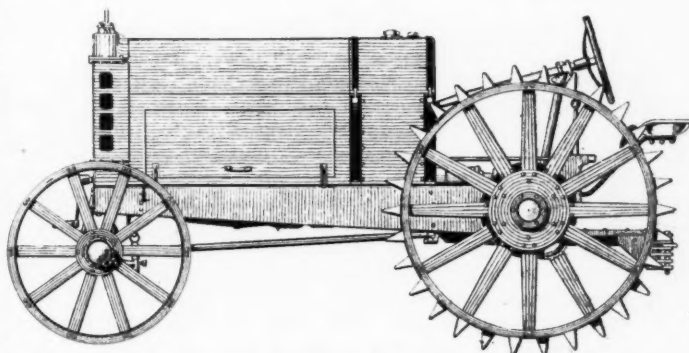
THAT it is now possible to assemble a farm tractor complete from parts offered in the market is proved by the example of the Champion tractor, which made its debut on the market at the Kansas City tractor show. This machine is the product of the Champion Tractor Co., Argo, Ill., and is manufactured from designs by Reed & Glaser, Indianapolis. Elimination of surplus weight and the possibility of removing any unit without disturbing adjacent ones have been some of the main objects aimed at by the designers. Practically all of the units are manufactured by firms which have established a name for themselves in related industries. All shafts are mounted on ball or roller bearings, and the bearings used are said to be of very liberal size for the loads they have to carry. All of the wearing parts are completely enclosed, and the tractor as a whole is of simple and clean-line design. It is quite light in proportion to the power it is capable of delivering on the drawbar.

A Buda 4-cylinder special tractor type of engine is fitted, with a bore and stroke of $4\frac{1}{4} \times 5\frac{1}{2}$ in. respectively. It is unnecessary to go into the details of construction of this engine, as a full description has appeared in a former issue of AUTOMOTIVE INDUSTRIES. Suffice it to say that the engine is provided with a Pierce automatic governor which maintains a constant speed of 1000 r.p.m.; it delivers from 29 to 32 hp. on the belt, while the drawbar horsepower attains a maximum value of $17\frac{1}{2}$, and a constant value of 14 can be depended upon. There is full force feed lubrication to all engine bearings, from a gear type pump which produces a pressure of 30 lb. The total weight of the engine, including the regular equipment, is 800 lb.

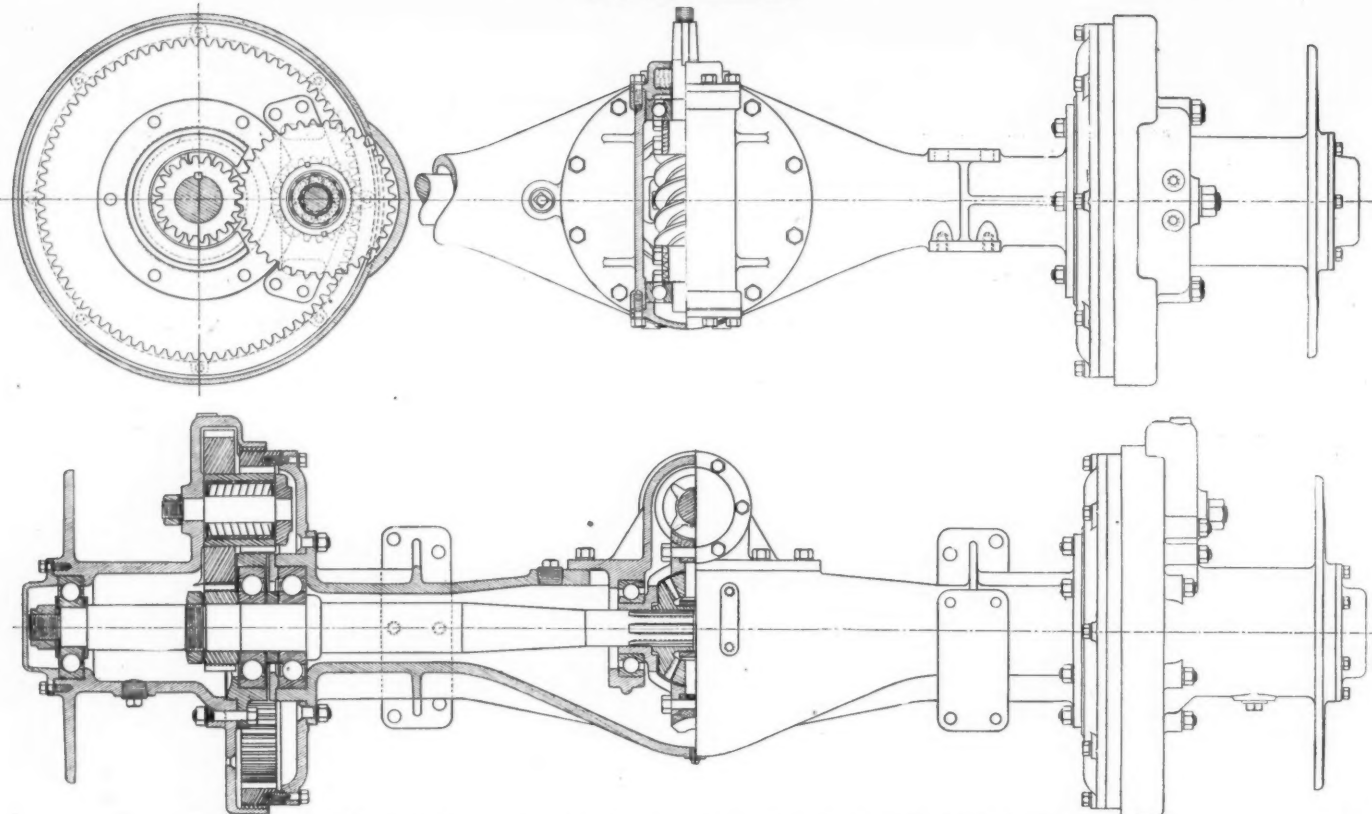
The tractor exhibited at Kansas City was designed to burn gasoline, though the Buda tractor engine will also handle kerosene. A Carter vertical $1\frac{1}{4}$ -in. carbureter, U. S. A. type, is fitted and connects with the gasoline tank of $26\frac{1}{2}$ gal. capacity. The fuel tank is located back of the engine space and is of such form as to continue the outline of the bonnet. All air drawn into the carbureter is passed through a dry type enclosed air cleaner. Fuel is fed from the fuel tank to the carbureter by gravity, a fuel strainer being in-

corporated in the line. There is a tank gage on the tank, showing the amount of fuel carried. Cooling is effected by means of a Jamestown armored type cellular radiator, with removable cast-iron shell and a core 4 in. deep. There is a Moto-Meter mounted on the filler cap. The water capacity of the entire cooling system is $7\frac{1}{2}$ gal. The water is circulated by means of a centrifugal pump, and air circulation through the radiator is induced by a 20-in. roller-bearing fan which is driven by means of a 2-in. laminated belt, suitable provision being made for belt adjustments.

One point in respect to which the Champion differs from most other recently designed tractors is that it is equipped with a 3-speed transmission. This is of Fuller & Sons make and is combined with the engine in the form of a unit power plant. In a general way the transmission is of the motor truck type, with this distinction, that the second or intermediate speed is the direct drive, while the third or high speed is a geared-up speed. The direct drive speed is intended for plowing, while the geared-up speed is for light work. All of the gears of the transmission are made from drop forgings of alloy steel cut and hardened. The shafts of the transmission are mounted in annular ball bearings.



Left side elevation of Champion tractor



Two views of Champion tractor axle which combines the worm with the internal gear drive

Control of the different speeds is on the sliding selective principle, through a ball-handled vertical lever convenient to the driver. The clutch is of the dry disc type, 11 in. in diameter and is entirely enclosed. It is controlled by the usual foot lever and is normally in engagement. From the transmission the belt drive is taken off. The belt pulley is 12 in. in diameter, with 6 in. face, and the belt speed is 2600 ft. at 850 r.p.m. of the engine. The pulley is located on the right-hand side of the tractor.

It is in regard to the final drive and the rear axle construction that the Champion tractor differs from most others now on the market. There is a double reduction of speed, the first reduction being through a worm and wheel and the final reduction through a spur gear mechanism. A live rear axle is used, and all of the driving gears are completely enclosed. The number of reductions is four when driving on the high gear, three on the plowing speed, four on low and four on the reverse. The reduction ratios are as follows: High, 33.76:1; second, 57:1; low, 97.58:1; reverse, 154.98:1. From the sectional views herewith the arrangement of the final drive can be clearly seen. The axle shaft carries a spur pinion at the inner side of the wheel hub. This pinion meshes with the larger one of two adjacent spur gears mounted on a stud secured into the inner hub flange of the driving wheel. The smaller one of the spur gears rolls on a stationary internal gear carried by a circular plate bolted to a flange on the axle housing. The two planetary spur gears are mounted on a Hyatt bearing and the stud carrying this bearing is supported by a yoke on its outer end.

There are two universal joints in the worm shaft. Annular ball and Hyatt roller bearings are used in the rear axle. The axle shafts are made of alloy steel, 2½ in. in diameter. The rear wheels are 48 in. in diameter and 12 in. wide. They comprise special rolled and welded rims and flat, hot-riveted spokes. Each wheel is provided with 30 lugs. The reductions obtained in the worm and the internal gear respectively are about equal, the worm reduction being 7.75:1 and the internal gear reduction 7.5:1.

A pressed steel channel section frame is used, the channel side members increasing in depth from the front to the rear and fastening at the rear end to lugs on the rear axle housing. The use of this frame permits of removing the transmission and the engine bodily from the tractor without dismantling

the whole machine. The front wheels are 32 in. in diameter by 6 in. width of rim and are also of the built-up type. Steering is effected by means of a large hand wheel through a Wohlrab worm and nut irreversible mechanism.

The wheel base of the Champion tractor is 80½ in. and its tread at the rear is 58 in. The total width is 70 in. and the total length 130 in. The front axle, which is of I section design, is braced to the frame by two long radius rods which have a ball joint at the forward end of the transmission casing. The frame is supported upon the front axle through the intermediary of a semi-elliptic spring, which is provided with oblong eyes at both ends so as to provide for the necessary spring play without the use of shackles.

The drawbar hitch is adjustable both laterally and up and down. To the rear end of the platform is secured a bracket with a number of rearwardly extending superposed lugs, between any two of which a transverse bar can be placed. Concentric holes are drilled through all of the lugs, and a pin can be inserted to hold the crossbar in place. This crossbar is drilled with a number of holes along its length which provide for lateral adjustment of the hitch.

The total weight of the Champion tractor is 3190 lb. It is designed to handle three 14-in. plows and a 24-in. thresher.

Roberts Priming Cock

THE Roberts Brass Mfg. Co. has brought out a dustproof priming cock which is very similar to other priming cocks except that the handle, which is a stamping, has a small circular cover plate integral with it. This is twisted over so as to cover the top of the priming cup when the cock is closed. This prevents the settling of dust in the cup and is sold for use with automobiles, motorcycles, trucks, tractors, motor boats, etc.



Fuel Limitations of Tractor Engines*

Methods of Overcoming Common Tractor Engine Troubles Pointed Out in Review of Design

By H. L. Horning

Chief Engineer, Waukesha Motor Co.

FOUR-CYLINDER tractor engines seem to be rapidly becoming standard. There is a slight increase in the use of overhead valves, but the L-head cylinder is the most popular. Ford, Overland, Maxwell, Studebaker, and Dodge cars are greatly in the majority on farms, and farmers are familiar with this type of engine. Tractors are not built for nor operated by engineers, and many elements of design in a tractor for use in the next five years must be determined from an economic viewpoint. Besides, it can be shown that with the knowledge we now have a very close, if not equal, result in power and economy can be obtained with an L-head as with a valve-in-the-head engine for truck and tractor use, within the limits of 90 lb. m.e.p. and 0.62 lb. fuel consumption per horsepower-hour at speeds within 10,000 r.p.m.

Tractor Forms—Tractors vary considerably in form and design. There are four general types of tractors:

A—Automobile type, of which Ford, G.M.C., Heider, R. & P. are representative.

B—Cross engine type, of which the Huber, Parrett and Case are representative.

C—Special purpose type, of which Holt, Best, Cleveland, Trundaa, Yuba, Bullock are types of the Caterpillar forms, while the La Crosse and Bates Mule, together with other unique forms, particularly designed for certain service form the others of this class.

D—Farmer type, such as Gray and Nilson, many of the International, Avery, E. B. models are built on the basis of long field experience, and give general satisfaction.

Engine—Four-cylinder, vertical, L head.

Transmission—Four speeds, three forward and one reverse.

Method of Propulsion and number of wheels—Four wheels.

Service Problems with Relation to Fuel

It is unnecessary to go into engine design, as there are many engines giving fair success. It has been thought advisable to deal at length with the list of troubles with engines which have been found to demand the greatest amount of attention from the farmer.

The list below is taken from an investigation by the Department of Agriculture, covering 2179 reports.

TRACTOR-ENGINE TROUBLES

Magnetos	299
Spark plugs	110
Carbureters	104
Bearings	80
Cylinders and piston rings	61
Valves and springs	43
Lubrication	29
Starting	28

We will now proceed to consider each of the foregoing from a broad standpoint, and to particularly point out the relation of fuel to these difficulties.

Magnetos—There is no doubt that magnetos are liable to troubles which are due to the conditions of tractor service in which this beautifully made device is expected to stand out all winter or through April showers and function immediately on demand of the careless owner. With present fuels it is difficult to ignite the mixture, owing to defects in carburetion.

*Paper read before Detroit Section Society of Automotive Engineers, April meeting. Condensed.

A number of tests show that with present systems of carburetion as much as 20 per cent of the fuel fails to contribute to the power output. This loss affects the results through rapid coating of spark plugs with the carbon of incomplete combustion. Magnetos do not benefit any more than the motors generally from carbon coating and short circuit of the plug. Reports of service men indicate that magnetos are often blamed for conditions arising from carbon deposits in the cylinders.

Spark Plugs—Closely related to magneto difficulties are those in which the spark plug is involved. When we are told that upward of 100,000,000 spark plugs are sold annually, we realize the difficulties which present engine construction and the necessity of using low grade fuels impose upon the spark-plug manufacturer. Generally speaking, a spark plug in a tractor engine is seldom exposed to the temperature stresses of an aviation motor, and yet one of the controlling factors of power production in tractor engines is the pre-ignition of the mixture due to high spark plug temperatures. This, of course, applies to the electrodes which attain high temperatures. Present fuels contain heavier elements which have end points from 367 deg. Fahr. upward, and these break down easily. Good designing may eliminate preignition largely, but fuel limitations cause many of the objectionable spark plug difficulties discussed under the heading of detonation. While the tractor spark plug with poor designing of cylinders with respect to water circulation is prone to cause preignition, yet many plugs run too cool, which prevents the burning of the inevitable carbon deposits and, in fact, very much favors the formation of carbon. One of the most important points in the design in a tractor motor is the location of the spark plug. The general considerations are as follows:

Summary of Spark Plug Requirements

1. The plug should be located as near as possible to the center of gravity of the mixture in the combustion chamber when the mixture is about to fire.

2. It should be so located as to be out of the exhaust gas stream.

3. It should be so located as to get the blast of this incoming rich mixture, or in such a place as will insure that the mixture surrounding the electrodes will be highly explosive and not deadened by residual charge.

4. The cooling water stream which has picked up a large volume of heat from the exhaust valve environments usually insures temperature enough to keep a good clean plug and cooling effect that will keep preignition out of the probabilities.

5. No cylinder head should be designed which will demand a long spark plug so as to reach the mixture.

6. A vertical spark plug is the only type which runs a long time without cleaning. In a valve-in-head motor the spark plugs must be placed at an angle in the head, and this is one of the inherent defects of this motor, as the oil cannot drain as well from a plug so located as from a vertical one.

7. The plug should not be placed so as to get the direct sweep of gases passing by the piston and rings on the suction stroke.

The above observations are particularly for the guidance of the engine designer, who must also bear in mind that the motor must work irrespective of where the farmer buys his plugs. Should the user desire advice as to the type of plug, it is only necessary to observe the following points:

A. The insulator should be of the best grade of porcelain or stone now available.

B. The center electrode should be at least 3/32 in. in diameter, well smoothed off, rounded, and the distance from its tip to the outside air a minimum. Cooling ribs are very desirable. No sharp corners or points should be presented to the combustion chamber.

C. It is not so easy to give general specifications for a good mica plug, although there are many good ones. As a class they are to be avoided.

Aside from temperature problems, the greatest difficulties with spark plugs arise from the deposit of carbon. Excessive lubrication in the combustion chamber may result from heavy fuel and further favors the short-circuiting of the plug with oil and carbon.

Carburetor Problems

Whatever the shortcomings of carburetors under other conditions, there is no doubt that they must stand some real maltreatment for any and all trouble symptoms on the truck and tractor. The continual fussing with carburetors in and out of adjustment is responsible for the wide range of results obtained.

The gradual increase in the boiling temperature of the heaviest fraction in the fuel is imposing a difficult problem on the engineer and is also the cause of frequent and sometimes unnecessary adjustment of carburetors. Fuels differ widely, as will be shown in a later part of this paper, running from the light, easily vaporized fuel entirely within the range of modern gasoline carburetors and vaporizers to way beyond what can be handled. As a matter of fact, it is easily demonstrated that the average engine actually returns useful power from only 80 per cent of the fuel. Whatever may be the normal losses to the radiator, exhaust, friction horsepower, radiation, etc., in a modern engine burning a perfect mixture, one-fifth of our gasoline with an end point of 450 deg. cannot be burned in our present engines. We have demonstrated that it is commercially possible to increase mileage 50 per cent in many cases where mere vaporization is substituted for metering and fixing.

The name carburetor became a misnomer when the end point of gasoline exceeded 30 deg. Fahr. Present fuel specifications call for 50 per cent of fuel to come off under 302 deg. Fahr. All over 60 per cent presents a serious problem in vaporization.

Carburetors as commonly made to-day consist of four valves, using the term valve in the broadest sense as a means of controlling flow: 1—A needle float valve for maintaining a constant level of fuel; 2—A fuel valve or valve supplying the fuel in definite quantities; 3—An air valve or passage supplying air in response to the engine demand and in most systems regulating the fuel flow; 4—A heat valve, broadly speaking for the purpose of supplying a sufficient quantity of heat to vaporize that proportion of the fuel which lies beyond the 302 deg. Fahr. point and which is not properly vaporized by common carburetor and intake passages.

Modern carburetors are either devoid of the heat valve or have only rudimentary and inadequate means of thoroughly vaporizing the fuel. Herein lies the hope of our immediate future. No firm will be successful that cannot supply adequate heat control. By far the greatest number of our engine difficulties from fuel characteristics arise out of the simple necessity of a properly vaporized fuel.

Supplying Heat to Fuel Mixture

The heat may be supplied in many ways. The valve referred to may consist of a thin membrane to conduct heat of water or exhaust. It may consist of a thick-ribbed section. It may consist of ingenious heating of the air or fuel or both, or a combination of many heat devices; but whatever it is, fuel must be vaporized and the operator must have control of the flow of heat to the fuel.

Manograph charts of common designs indicate a vast change in mixture composition from one explosion to the other. One explosion varies from another as night and day. Preignition, rapidity of initial ignition stages, variable explosion lines, detonation, multiple combustion, incipient com-

bustion, late temperatures and pressures all alternate with good combustion effects.

One investigator has shown in working out a temperature control that a change of 8 deg. Fahr. in the neighborhood of the correct temperature (which I am not at liberty to give to you) makes a difference of 20 per cent in economy. The Bureau of Standards, working with a highly ingenious device for measuring flame propagation in the cylinders of a Liberty engine, finds that flame propagation varies from one explosion to another in the ratio of 1 to 7. Beyond these citations many practical evidences point to the fact that the fundamental defect of our present practice is lack of vaporization, hence heat control.

The foregoing remarks refer to the indefinite fuel known as gasoline. The art of vaporizing kerosene is still in an undeveloped state, and we fail in handling kerosene for the same lack of a better understanding as to how to prepare the mixture.

No mention has been made of the limitation of fuels due to chemical compounds of such instability that they will not stand the destructive effect of the heat and pressure developed in the first stages of combustion.

The explanation of considerable deposits of carbon in the cylinder and of the gas knock known as "pink" preignition, etc., generally most noticeable at the bottom of a hill, upon the sudden use of the accelerator or at overload, so called, is fuel composition. This will be dealt with under the heading of fuel, but is mentioned here as one of the limitations of fuels which can be distinctly reduced by proper vaporization methods.

Bearings and Lubrication

Nothing can take the place of design and good workmanship in bearings, nor can lubricating oil be expected to cover the defects of a bad system of lubrication.

The common method of lubrication is splash, in which the level is established by overflow dams. Another form—and the most reliable—is the splash system in which the oil level in deep troughs is maintained correct irrespective of the inclination of the engine. The oil-pump capacity in pumping the oil into the troughs is just equal to the capacity of the scoops to throw the oil out. Inasmuch as the oil pump capacity varies as the speed of the engine and the rod scoop capacity varies, the level of the oil is always assured and constant.

Force feed through hollow crankshaft is a well-known and high-class system. It has not been widely adopted because of the difficulties with leakage of oil under pressure both past the piston and rings and at the crankshaft and because of the unusual workmanship required for the pressure maintenance. In both the above-mentioned systems old oil is pumped over and over, and this leads to bearing troubles with tractor engines.

Defects of Lubricating Oil

Lubricating oil is little understood even by the refiners. Most tractor oil is so loaded with the heavier portions that under high pressure and temperature under the piston heads and walls it breaks down into lighter oils, carbon and tars. Added to this, many engines suffer from dirt, dust and sand which enter either at the carburetor or breather. Taken together, the oil in the crankcase of an engine in use for a month with either the splash or common force-feed systems is usually a bad mixture and entirely unfit for lubrication uses.

With the force-feed system unusual care must be taken to strain and settle all grit or dirt out of the oil, or it will cause unusual damage to journals and bearings. No such care is necessary with the splash system, as it seems to develop the least difficulties with dirty oils. With clean oil well filtered in use and an oil of good body, the force-feed system works exceedingly well so long as the bearings are in good adjustment. A surplus capacity of oil must be available at all times, so one or more bearings in a loose condition will not starve other bearings. Unusually good piston and cylinder fit must prevent overrolling of cylinders when rod bearings are loose.

The ideal system, if expense and care are no object, is the

force feed of fresh oil to crankshaft bearings and cylinder in exact quantities. So far as results are concerned on the surfaces, bearings lubricated by this method are not only the most economical in oil consumed but also insure the longest life to both journals and bearing surfaces.

This brings us to the effect of heavy fuel on the bearings of tractor engines. Incomplete vaporization leaves heavy fuel unburned, incompletely burned and decomposed on the walls of the cylinder and combustion chamber. Under the action of high heat the fluid residue flows down the cylinder and past the rings through the oil drain holes so commonly used into the crankcase.

The products of complete and incomplete combustion found in crankcase oil range in hydrocarbons from formaldehyde to sugars. They include acetone, alcohols, sorghums, formic acid and a list of disinfectants varying in constitution according to the circumstances of combustion. This mixture, taken together with the solid contents mentioned above, constitutes about the worst lubricant a cylinder and bearings could have. The lower crankcase is the catchbasin for the byproducts of the imperfect combustion process. It is the main sewer for decomposing body fillers of our poorly compounded lubricating oils. It is the settling basin for steel, iron and bearing particles which slough off into the lubricants, and the crankcase with its oilpan forms the dustpan of the self-appointed air cleaner which duty every engine takes upon itself. Taken from an unbiased standpoint, have not engineers in tractor engines of to-day finally arrived at about the worst lubricating conditions possible? Is there any device which would permit more fuel to get into the lubricant than our present design of oil scraper pistons? The man was a great philosopher who said, "Tractor engines work in spite of the designers and users."

Effects on Journals and Bearings

The heavy fuel and byproducts of combustion seem to have had effects on steel journals and bearing materials. In England some practical men, and engineers as well, consider an engine "done for" if it is once thoroughly saturated with some of the fuel compositions.

Economic factors impose the splash system and its most thoroughly worked out form as being a good standby under all circumstances. Most men understand it best, or, to be frank, pay least attention to it. As an all-around system it takes care of itself better than any other. The ideal system of fresh oil to all points is perfect, theoretacilly, but the complication and details, together with thickening of oil in cold weather, make it hard to introduce. The force feed through the crank will become widely used when manufacturers and users know more about it.

Bearings suffer under heavy fuel conditions due to the high pressure of detonation and preignition. Preignition can be controlled by design, as will be noted under Cylinders, Pistons and Rings. Both preignition and detonation are limiting factors of our modern fuels.

It is not possible to state which of the two evils is the most detrimental to the bearings, the dirty condition of the engine crankcase or the detonation pressure.

In closing these remarks on bearings it is well to call attention to the increase in bearing troubles with decreasing fuel quality and the increasing fuel and waste product content of lubricating oil since using the pistons with lubrication drain holes.

Cylinders, Pistons and Rings

An ideal combustion chamber would be a sphere with a uniform wall thickness, of uniform temperature as high as possible without causing decomposition of the fuel in use. Practical considerations make such a combustion chamber not attainable at present.

Heavy gasoline and kerosene and fuel made by cracking processes ranging in boiling points from 302 to 575 deg. ignite at lower temperatures than better gasoline. Under stress of temperature and pressure they detonate after the initial explosion. The preignition is lost work and is damaging to the bearing. Preignition may be the one cause of detonation.

The ideal for which we have all been striving is the burn-

ing of all fuel down to heavy kerosene and even beyond by designing all the apparatus involved so as to prevent preignition, detonation and breaking down of the fuel; this to be accomplished without water, special fuels or admixtures, with a fuel consumption approaching that with the best gasoline and with a minimum loss of mean effective pressure.

To measure progress we have set up a yardstick of performance, using the ratio of fuel consumption per horsepower-hour to the brake mean effective pressure.

In burning heavy fuels the greater the heat application the better the economy figure. The greater the heat the less the brake mean effective pressure. All devices attempt to keep horsepower output to as near the gasoline output as possible by supplying a minimum of heat to the incoming mixture. You will note that great economy usually goes with low mean effective pressure.

By thoroughly vaporizing the kerosene in the manifold, it is possible at this time to get within 10 per cent of the present gasoline horsepower; to get equal fuel economy with gasoline. Using the same principles it is possible to improve gasoline economy by more than 20 per cent.

It has long been known in the art of coal-gas making that combustible hydrocarbons formed under the high temperature conditions of the gas retort have such stability under heat that considerable heat energy is necessary to break them down or to change their atomic structure. Such fuels act with clean combustion lines. Compression pressure reaching far beyond anything used in practice to-day results in no preignition detonations and in increased horsepower outputs. Such fuels have the benzol ring as their base and range down to naphthalene and anthracene. A mixture of these with ordinary gasoline or kerosene will eliminate the knock at good compression, even when the proportions of benzol and derivations are low. In motors of poor design where knocking is common a much better horsepower can be obtained with these stable fuels.

Whether it is possible to produce fuels stabilized by the ring compounds is an economic problem which is now receiving the attention of the best business brains of this industry.

Fuels are now being produced by cracking and other processes which bid fair to meet some of the demands for better and lighter fuel.

Hot spots in the cylinder cause the greatest trouble with modern fuels. Cylinder walls, pistons and rings suffer owing to the poor vaporization of fuel. The heavier constituents of the fuel mix with the lubricating oils which pass upward, thus reducing their viscosity and lubricating value. Dirt, dust and carbon on the cylinder wall all reduce the life of the piston, ring and wall surfaces. Aside from better vaporization there is room for great improvement in piston and ring design. Piston design offers about the only chance of keeping down the combustion-chamber temperature.

Valves and Springs

Poppet valves are always a problem. Heavy fuels cause trouble at this point because of their imperfect vaporization. Most valve troubles are due to carbon deposits, warping of cylinders and improper water circulation. It would be a great aid to the maintenance of good compression and valve seating if the valve could be positively revolved. Valves are damaged because of the unequal heating of the seats and stem. Revolving the valve slightly, each revolution distributes the heat load, and eventually the valve develops an absolutely correct seat. In this connection the device must not cause any more care, cost of maintenance or annoyance than the valve grinding. Valve springs suffer indirectly because of the fuel due to gumming of stems.

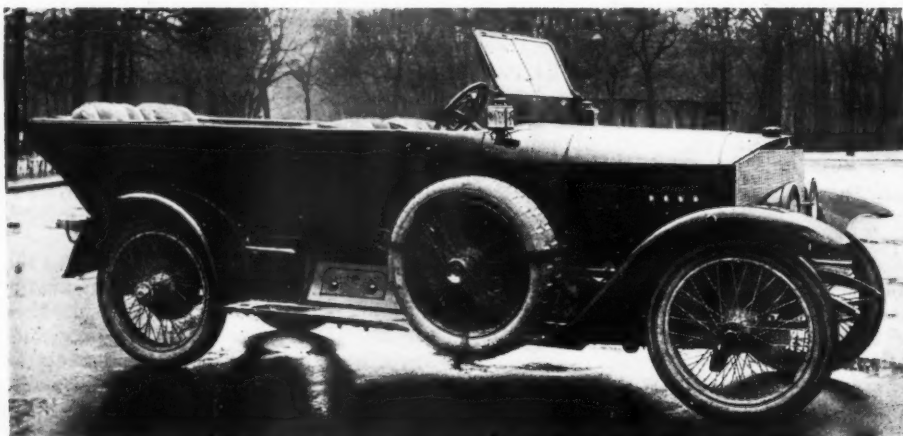
It is fortunate that the Bureau of Standards is taking up a program of investigation on lubricating oil which when complete will give us the data that will be the basis of future lubrication.

Generally speaking, the characteristics of most lubricating oil offered to-day by reliable refiners are dependent more upon the convenience of the refiner than upon the requirements of the user of the oil. Lubricating oil can be considered to consist of three parts: The light spindle oil, the medium weight, and the heavy cylinder stock.

(Continued on page 1043)

Ex-Kaiser's Latest Mercedes Car

Machine Captured by French in Strasbourg Has Knight-Type Engine, Full Electrical Equipment and a Body of Advanced Design



EX-KAISER WILHELM II's latest automobile appeared on the streets of Paris recently. During the summer of last year the German Emperor placed an order with the Daimler Motoren Gesellschaft at Unterturkheim for the latest type of Mercedes chassis. This was delivered to the Forrlor Body Works at Strasbourg for a special touring body to be fitted, and the work was just about completed when the armistice and the flight of the Kaiser into Holland made delivery a rather difficult matter. When the Allied armies went into Strasbourg communication with the interior of Germany was cut off, and instead of being delivered at Berlin the Emperor's car was last month driven over French roads into Paris.

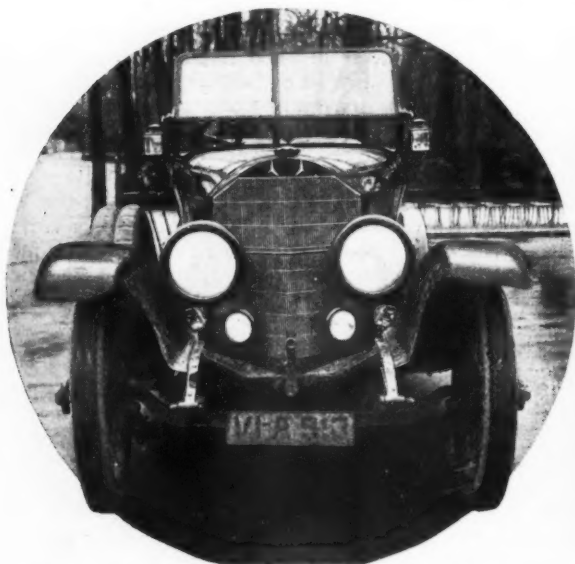
This latest type Daimler Mercedes is a four-cylinder car having a Knight sleeve-valve engine of 100 by 150 mm. (3.9 by 5.9 in.) bore and stroke. It is officially rated at 24-45 hp., but actually develops 70 hp. at 1800 revolutions. A Mercedes carbureter, with extra air control, is fitted, and the engine is provided with a supplementary lubricating system for the upper portion of the sleeve valves. Ignition is by high-tension Bosch magneto, placed on the left-hand or exhaust side of the engine, and driven from timing gears at the rear. The electric lighting set is also Bosch, the generator

being on the right-hand forward end of the engine. The starting motor, however, is a Bijur.

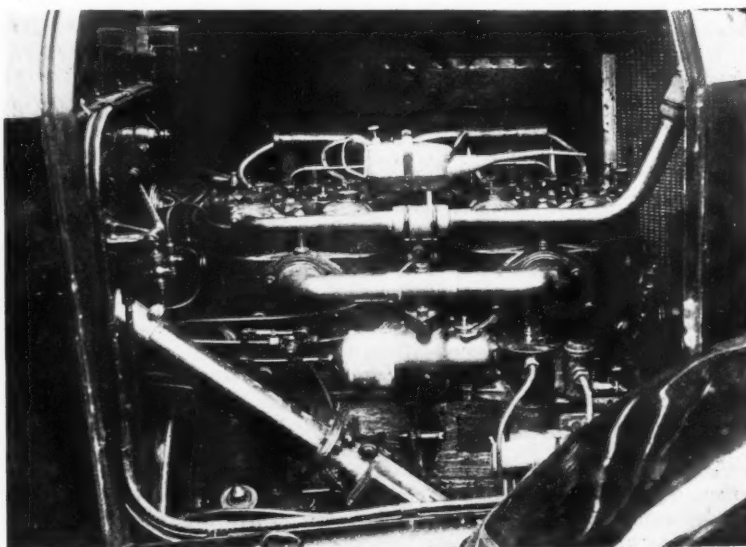
The body work is a particularly fine example of up-to-date German lines. As will be seen from the illustration, the sides are narrower at the bottom than at the top, this giving an outward flare. About four inches from the top the sides become absolutely vertical, and the top rail of the body is in a straight line with the top of the hood. This, together with the straight line formed by the break from the inclined to the vertical sides, gives a very pronounced straight line effect to the body. The folding top disappears in the body, while the stern of the car is of the reversed clipper bow type, giving

the greatest length near the top of the body. Seats are of the Pullman type, with two very comfortable folding seats facing forward. The windshield is divided vertically down the center, so that the driver's portion of the shield can be opened while the passenger obtains full protection. Glass is fitted in place of the usual board between the bottom of the windshield and the dash. Fenders are only moderately domed, those at the front being a single piece with the valences, and no bolts being visible. The car is fitted with detachable wire wheels, with two spares carried on the right-hand running board. The headlights are carried in the normal position in front of the radiator. The small lamps are rather peculiarly placed below the headlights but nearer the center of the pointed radiator than are these two latter. In addition to these there are two square carriage lamps carried on brackets attached to the windshield supports.

ACCORDING to an article in *Der Motorwagen*, an oil pump has been patented by a Munich inventor which consists essentially of two six-step rotating pistons and connections. The first piston acts as the oil suction, and the second as the pressure delivery.



The ex-Kaiser's Mercedes car brought to Paris



Intake side of latest Mercedes engine on ex-Kaiser's car

A Plan to Stabilize the Dollar in Purchasing Power*

The Effect of Our Present Monetary Standards on Prices—A Suggestion That We Vary the Value of the Dollar and Thus Fix Its Buying Ability

By Irving Fisher

OBVIOUSLY no explanation of a general rise of prices is sufficient which merely explains one price in terms of another price. To say that the cause of rising "prices" is rising "wages" is merely to say that the prices of commodities have risen because the price of labor has risen; and we might as well turn it about and say that the price of labor has risen because the price of food has risen and so driven workmen to strike for higher wages.

Scarcity will, in selected cases, go far toward explaining the rise of individual prices. But it will not go far toward explaining changes in the general level of prices—at least not before the beginning of the great war and only partly since that time.

All those who have offered explanations make one fatal mistake. They look at the wrong side of the market. They seek the causes wholly in the goods, the prices of which have changed, and not at all in the money, in terms of which those prices are expressed. It is hardly probable that commodities should rise in price en masse without some simple explanation in common. This corresponds with common sense.

Price Fluctuations Due to Money Conditions

Our conclusion is that until recently, at least, it was a fall in the value of gold, or money, that had taken place, rather than a simultaneous rise in the value of everything else.

That great price movements are chiefly monetary is evidenced by the fact that countries of like monetary standards have like price movements. Thus—to consider gold-standard countries—there is a remarkable family resemblance between the curves representing the index numbers of the United States and England. Again, the price movements in silver countries show a strong likeness, as in India and China from 1873 to 1893. On the other hand, we find also a great contrast between gold and silver countries. Speaking roughly, we may say that between 1873 and 1896 the price level in gold countries fell 25 per cent and in silver countries rose 30 per cent.

In the present war the data are so meager that it is impossible to express the relations in exact figures, but we may arrange the different countries in the approximate order in which their prices have risen. As a result we find that the order of the nations corresponds, in general, with the order in which the currency in those nations has been inflated by paper as well as with the order in which their monetary units have depreciated in the foreign exchange markets. This order—of ascending prices and of inflated currency—is: India, Australia, New Zealand, United States, Canada, Japan, Sweden, Switzerland, Denmark, Italy, Holland, England, Norway, France, Germany, Austria and Russia. Confirmatory evidence is found in the fact that the ups and downs of prices correspond with the ups and downs of the money supply. Throughout all history this has been so.

The present war furnishes important examples of this. In the United States the curve for the quantity of money in circulation and the curve for the index number of prices run continuously parallel, the price curve following the money curve after a lag of one to three months, as might be expected, money being the cause and price the effect. It was in August, 1915, that the quantity of money in the United States began its rapid increase. One month later prices began to

shoot upward, keeping almost exact pace with the quantity of money. In February, 1916, money suddenly stopped increasing, and two and a half months later prices stopped likewise.

The conclusion toward which the foregoing and other arguments lead is that in the past the great outstanding disturber of the price level has always been money, and that at present the great outstanding cause of the high cost of living is money. It is curious that every time inflation of any kind has visited a country the public has had to be re-educated. The evils of colonial and continental paper money were forgotten by the generation of the Civil War, and the evils of the greenbacks are forgotten by most people to-day. At the present time we are confronted with still another kind of inflation, due not to specie, but to the use of checks. In so far as we subscribe to our war loans out of money borrowed at the bank—that is, out of an increase of deposit currency and not out of real savings—we are adding to inflation and to its evil effect on the cost of living.

Money is so much an accepted convenience in practice that it has become a great stumbling block in theory. Since we talk always in terms of money and live in a money atmosphere, as it were, we become as unconscious of it as we do of the air we breathe. Some people, even intelligent people, bolster up the illusion that the dollar is a stable standard of value by reference to the fact that "the price of gold" never changes. Only recently a former Government officer asserted that the value of gold is evidently constant because its price is fixed!

A dollar is 25.8 grains of standard gold—that is, of gold nine-tenths fine; and, since an ounce is 480 grains, the number of dollars in an ounce is $480 \div 25.8$, or 18.60. In other words, any 100-ounce lump of standard gold taken by a gold miner to the mint can be cut up and coined into 1860 dollars and handed back to him. Naturally he gets \$18.60 an ounce, and this "price" can never vary so long as the weight of the dollar does not vary.

Gold Dollar Fixed in Weight but Not in Buying Power

Thus 100 ounces of gold will always be worth 1860 dollars of gold so long as 1860 dollars contain 100 ounces of gold; just as a quart of milk will always be worth two pints of milk so long as two pints make a quart. Gold is stable in terms of itself and in terms of itself only. Fixing the dollar at 25.8 grains of gold fixes the price of gold at \$18.60 an ounce. But, of course, this fixity of dollar weight, or of gold price in terms of gold, does not fix its price or value in terms of other commodities. It does not release gold from the effects of supply and demand. The value of the dollar, as shown by its general purchasing power, is not stable but fluctuates with supply and demand as does the value (or purchasing power) of anything else.

If, instead of gold, we were to make milk the standard, or eggs—that is, if we used these to purchase all other things—they would acquire the same fixity of price—that is, price in terms of milk or eggs; and we would fall victims to the same illusion of inherent fixity.

An increase of money, then, always tends to raise prices. It was thus that prices rose in the mining camps of California a half dozen decades ago and in Colorado and the Klondike one or two decades ago. This local rise of prices soon communicated itself to other places; for the price level cannot

*Abstract of a paper read by Prof. Fisher before the Editorial Conference of the Business Publishers' Association.

in one locality greatly exceed that in a neighboring locality without causing an export of money to the locality of the lower level. Thus new money gradually finds its way into circulation throughout the world, raising prices as it flows from place to place, the process consisting, in all cases, of the effort on the part of somebody to get rid of an inconvenient surplus—a surplus which cannot be dissipated by transferring it from hand to hand, but only by a rise of prices. Of course, the price level is affected not only by the quantity of money. It is affected also by credit currency—that is, the so-called “money I have in the bank,” which one pays out in checks. Moreover, the price level is affected by the rapidity of circulation both of money and of deposit currency and by the amount of commodities in trade. The price level may rise because of an increase of money or of deposit currency, or because of their rapidity of circulation, or because of a decrease in the volume of trade. And back of these causes (money, deposits, their velocities, and trade) lie innumerable other causes acting through one or more of them.

Dollar a Unit of Weight

Our dollar is now simply a fixed weight of gold—a unit of weight, masquerading as a unit of value. A twentieth of an ounce of gold is no more truly a unit of value or general purchasing power than a pound of sugar or a dozen eggs. It is almost as absurd to define a unit of value, or general purchasing power, in terms of weight as to define a unit of length in terms of weight. We would scarcely define a yardstick as any stick which weighs an ounce.

What good does it do us to be assured that our dollar weighs just as much as ever? Does this fact help us in the least to bear the high cost of living? We complain of the dollar, and justly, that it will not go as far as it used to. We want a dollar which will always buy the same aggregate quantity of bread, butter, beef, bacon, beans, sugar, clothing, fuel, and the other essential things that we spend it for. What is needed is to stabilize or standardize the dollar just as we have already standardized the yardstick, the pound weight, the bushel basket, the pint cup, the horsepower, the volt, and, indeed, all the units of commerce except the dollar.

Except the dollar, none of the old rough and ready units are any longer considered good enough for modern business. The dollar is the only survival of those primitive crudities. Imagine the modern American business man tolerating a yard defined as the girth of the President of the United States! Suppose contracts in yards of cloth to be now fulfilled which had been made in Mr. Taft's administration!

And yet the shrinkage in such a yardstick would be no greater than the shrinkage we have suffered in the far more important yardstick of commerce, the dollar; and this yardstick is used, not only in the few contracts in which the yardstick of length is named, but in all contracts of business! We tolerate our crazy dollar only because the havoc it plays is laid to other agencies.

Any Single Commodity Is Too Variable a Standard

A true standard of value, or general purchasing power over commodities, should not be dependent on one commodity merely, whether that commodity be gold or silver or wheat or what not.

Two commodities would be better than one, just as two tipsy men walk more steadily arm in arm than separately. Whenever they tend to lurch in opposite directions they neutralize each other. This is the argument which used to be urged for bimetallism, symmetallism, and other plans for uniting gold and silver. And the argument applies whenever gold and silver move in opposite directions, as from 1873 to 1896. A composite of gold, silver, copper, platinum, and all the other metals would be somewhat more stable than an amalgam of two. Money to-day has two great functions. It is a medium of exchange and it is a standard of value. Gold was chosen because it was a good medium, not because it was a good standard.

The argument that gold became money because it was thought to be a good standard of value is, so far as I can find out, an unfounded myth. Indeed, when it came into use as money, there were no index numbers and there was there-

fore no way of testing its stability or instability; and finally at that time there was not much need and not much thought of a standard of value, for the good and sufficient reason that there were few if any time contracts, such as promissory notes, mortgages or bonds. Almost all bargains were struck and settled on the spot. When a man was about to make a cash purchase it was immaterial to him what the monetary unit was.

But to-day if a man buys an article and promises to pay for it in three months the case is different. When the time for payment arrives it is very important for him to know whether the “dollar” is the same as was contemplated when the agreement was made. With our network of long-time contracts, running months, years, generations, or even centuries, including hundreds of billions of dollars in promises to pay money—promissory notes, mortgages, debentures, railway bonds, Government bonds, leases, etc.—the function of a standard of value—that is, a standard of deferred payments—has grown to be perhaps the more important of the two functions of money.

We now have a gold standard that is forever fluctuating. It is a gold standard with the “standard” left out! The proposal here made is really to put the standard into the gold standard—to standardize the dollar.

Vary the Weight of the Dollar

The method of rectifying the gold standard consists in suitably varying the weight of the gold dollar. The gold dollar is now fixed in weight and therefore variable in purchasing power. What we need is a gold dollar fixed in purchasing power and therefore variable in weight. I do not think that any sane man, whether or not he accepts the theory of money which I accept, will deny that the weight of gold in a dollar has a great deal to do with its purchasing power. More gold will buy more goods. Therefore more gold than 25.8 grains will buy more goods than 25.8 grains will buy. If to-day the dollar, instead of being 25.8 grains, or about one-twentieth of an ounce, of gold, were an ounce or a pound or a ton of gold, it would surely buy more than it does now, which is the same thing as saying that the price level would be lower than it is now.

But how, it will be asked, is it possible in practice, to change the weight of the gold dollar? The feat is certainly not impossible, for it has often been accomplished. We ourselves have changed the weight of our gold dollar twice—once in 1834, when the gold in the dollar was reduced 7 per cent, and again in 1837, when it was increased one-tenth of 1 per cent. If we can change it once or twice a century, we can change it once or twice a month!

Use Paper for Currency and Abolish Gold Coins

And if we use paper representatives of gold exclusively, instead of some paper and some gold coins, these monthly changes in the weight of the gold dollar can be made even more easily than the occasional changes were made which history records. In actual fact, gold now circulates almost entirely through “yellowbacks,” or gold certificates. The gold itself, often not in the form of coins at all but of “bar gold,” lies in the Government vaults.

If gold thus circulated only in the form of paper representatives it would evidently be possible to vary at will the weight of the gold dollar without any such annoyance or complication as would arise from the existence of coins. The Government would simply vary the quantity of gold bullion which it would exchange for a paper dollar—the quantity it would give or take at a given time. As readily as a grocer can vary the amount of sugar he will give for a dollar, the Government could vary the amount of gold it would give or take for a dollar. To-day the Government will give 25.8 grains of gold bullion to the jeweler or exporter for each dollar of certificates he pays in; next month it might give 26 grains or only 24 grains. These respective increases or decreases would of course be made for the purpose of compensating the decreases or increases in the purchasing power of the dollar.

But, it will now be asked, what criterion is to guide the Government in making these changes in the dollar's weight? Am I proposing that some Government official should be

(Continued on page 1043)

Dayton Starting and Lighting System

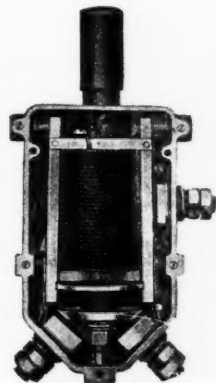
Specially Designed for Ford Cars—A Single Unit Connected Directly to the Crankshaft—Has a Special Form of Armature with Copper Bar, Form Winding Electrically Welded to the Commutator Bars

SEVERAL novel features are embodied in a starting and lighting system which is being manufactured by the Dayton Electrical Manufacturing Co., Dayton, Ohio, from designs of Vincent G. Apple. The outfit, which is of the single unit type, is specially designed for Ford cars, and it is possible to connect it directly to the crankshaft because of the new type of armature used. There is no cotton insulated wire used in its construction, the windings being made with flat copper strips cut to length and formed into hairpin loops which are inserted through a core of laminated iron discs. They are then bent into shape by a special machine to make them uniform, leaving the flat ends to weld to the commutator segments. This is done with an electric welder, which makes the commutator a part of the winding. The commutator, as will be seen from the illustration, is of the internal type. The idea of electrically welding the armature conductors to the commutator bars appeals, as it removes the weak link of the soldered joint, but it would seem to render more difficult the problem of "refilling" the commutator when worn out.

After the armature is assembled, it is impregnated with bakelite and baked, which makes it a solid, homogeneous mass impervious to oil and water. This armature, we are informed, can be shaped to fit the frame of any low-voltage dynamo.

The field frame of the dynamotor is made of semi-steel and has twelve field poles in which the armature rotates to generate the electric current. The armature winding is of the parallel type and there are twelve brushes bearing on the commutator. Two of these brushes are almost pure graphite, for lubricating the commutator, thereby eliminating any necessity of using oil on the commutator. The other ten brushes are made of metal-graphite composition.

The starting switch and automatic cut-out are combined, and this unit is claimed to contain fewer parts than any starting switch and cut-out on the market. It is mounted on the frame of the car under the heel board and is operated by pushing down on the starter button with the heel. This operation connects the battery in series, giving 12 volts for starting. When the starter button is released, it automatically comes back to the running position and the dynamotor then generates the electric current to recharge the 6-volt battery. This replaces the current which was used by the motor for cranking the engine and lighting the lamps. When the voltage of the dynamo drops below the charging rate, the cut-out in the switch automatically breaks the circuit between



Interior view, combined starting switch and automatic cut-out



Hairpins inserted through armature laminations

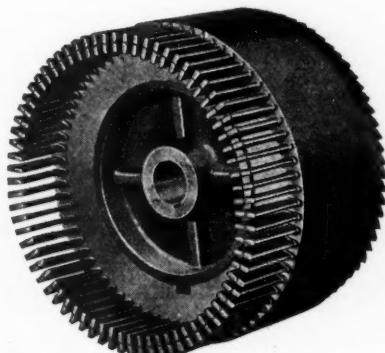
the dynamo and battery, so that the battery will not discharge when the car is running at too low a speed or when the engine is at rest.

Antimony in Copper

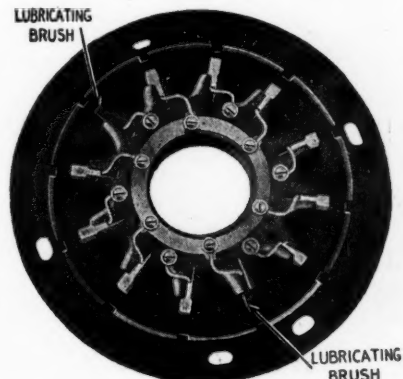
THE opinion has gained ground of late that small percentages of antimony do not deteriorate copper, as used to be feared, but make it harder and leave it fit for rolling. Reviewing the recent researches on the problem in *Metall und Erg.*, W. Stahl concludes that 0.3 per cent or 0.4 per cent of antimony is not at all objectionable, if present as metal or as copper antimoniate. A total impurity of the same amount of both nickel and antimony, i. e., about 0.15 per cent of each of these metals, is likewise to be welcomed rather than to be deprecated; such copper is also sound when hot. Combined with high nickel percentages, however, even a little antimony is bad; what is said for nickel also holds for manganese. When the copper contains bismuth, up to 0.05 per cent, enough antimony should be added to the fused copper at the commencement of the oxidation period to transform all the bismuth into antimoniate; the copper may then be rolled. As regards lead, similar restrictions apply.



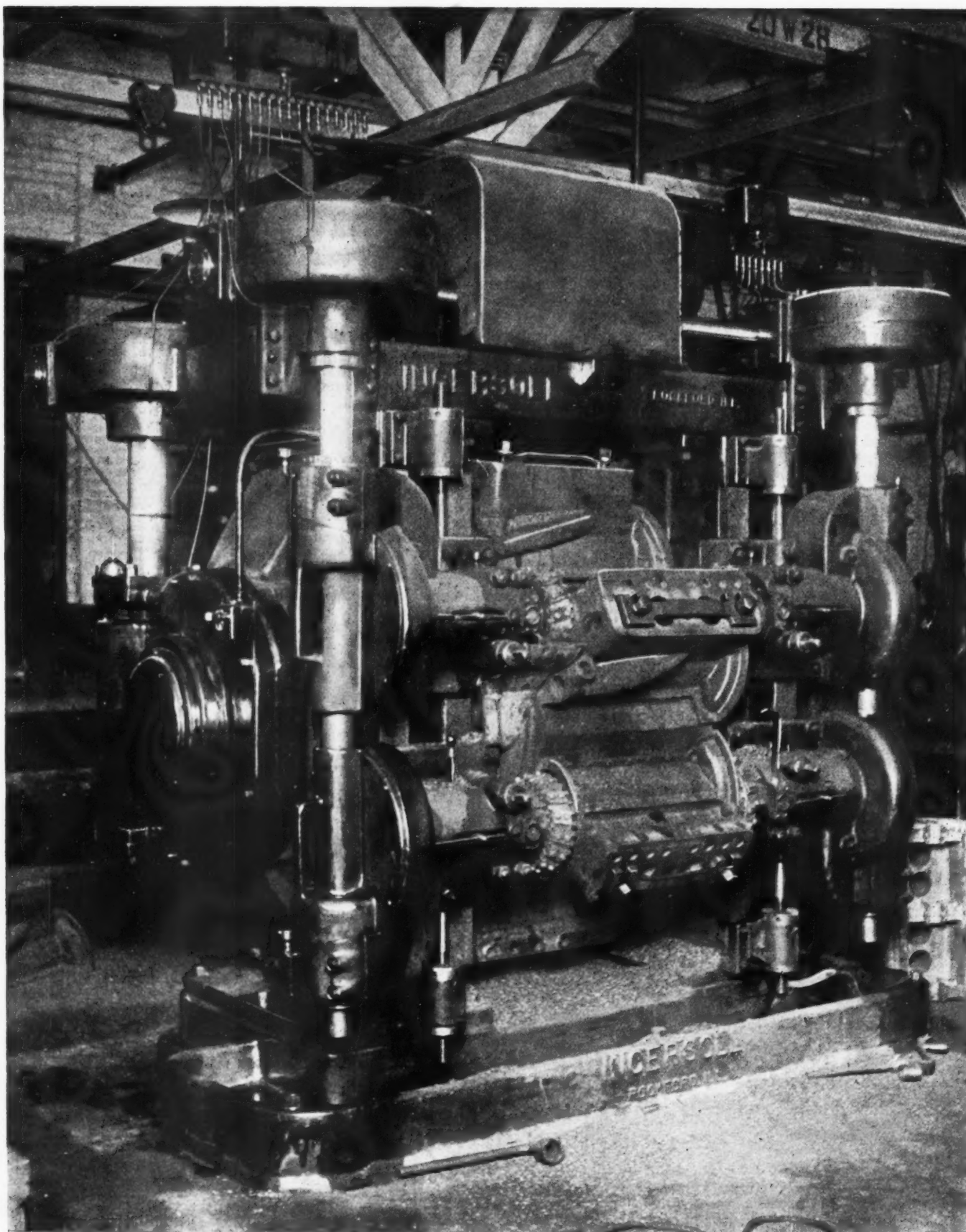
Completed armature



Hairpins shaped to weld on commutator



Commutator brush assembly



Milling Six Cylinder Blocks in One Operation

Rotary miller made by the Ingersoll Co. of Rockford, Ill., which handles six Fordson engine blocks at one time, milling the ends. This rotary miller takes both a roughing and a finishing cut, having four milling cutters, two on each end. It takes 3 min. to finish a cylinder block on this machine

Handling Parts in the Shop and on the Assembly Floor

Description of Tools and Conveying Apparatus Installed in the Tractor Works of Henry Ford & Son to Eliminate all Unnecessary Handling and Motion of Parts

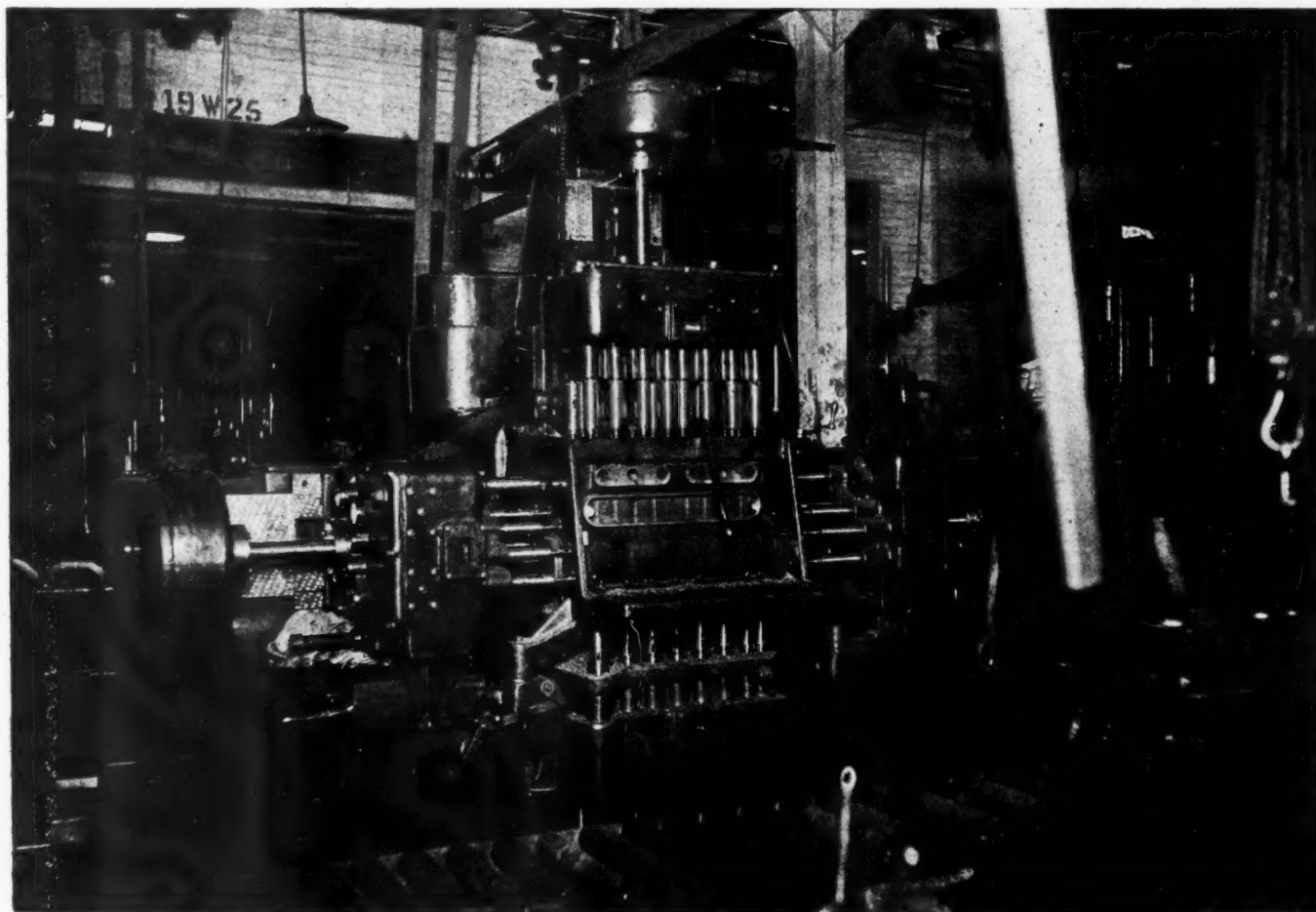
By J. Edward Schipper

SMOOTHNESS of flow and regularity are prime essentials in manufacturing processes if the greatest efficiency is to be secured. Manufacture and assembly which proceed along the lines of regular geometric figures are generally highest in efficiency. The simplest form of progression is, of course, along a straight line, but manufacturing progression may be in a circle, an ellipse, or a rectangle, and frequently it is in the form of a straight line, with shorter feeding lines which enter this straight line at different points.

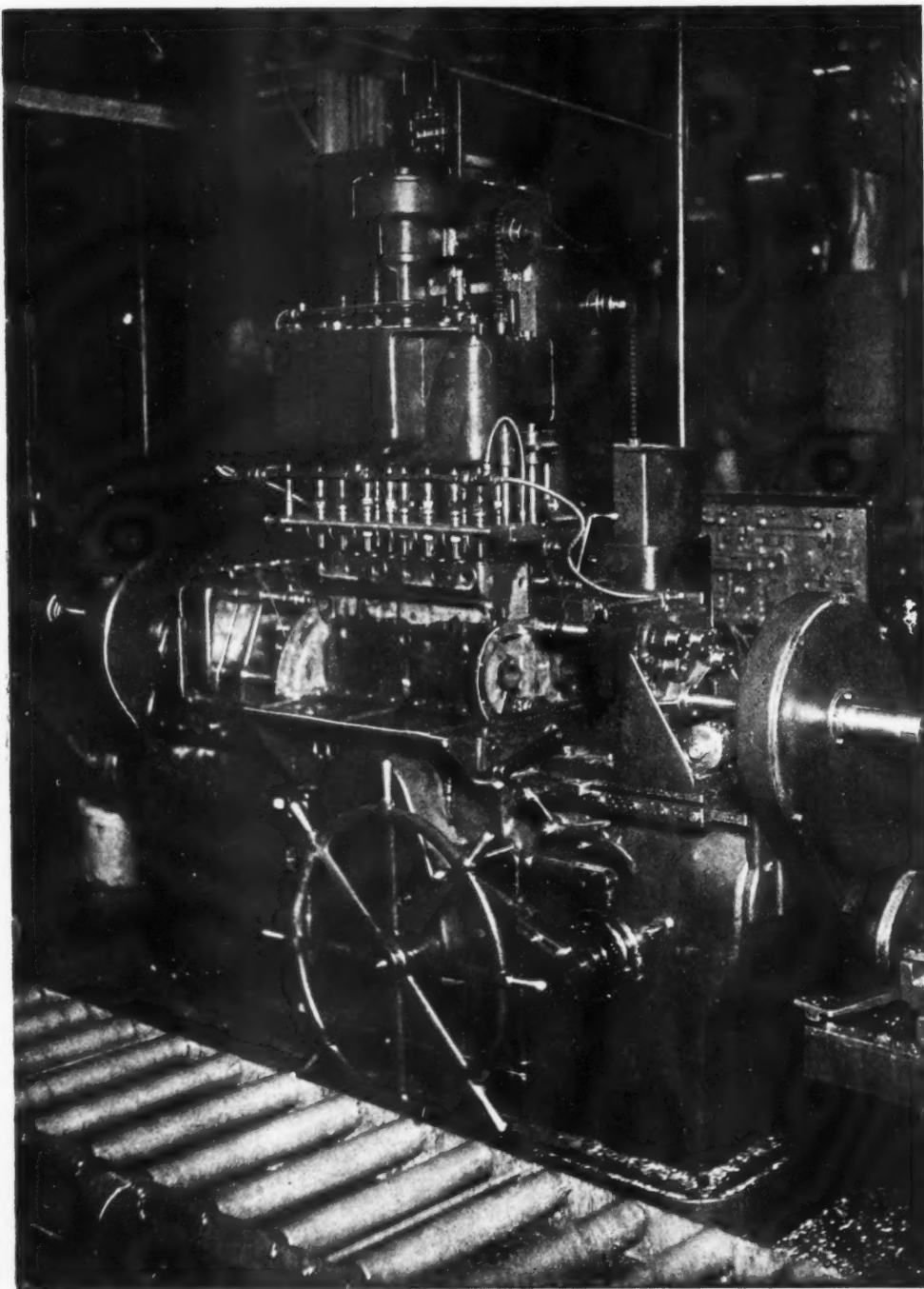
The ultimate object in the use of conveyor systems

and special machinery is to secure this smoothness. Where a machine does the work of two, it reduces the amount of variation from straight lines or other regular geometric progression by a large percentage, because the very act of taking a piece off a conveyor, putting it on a machine and back on the conveyor again constitutes a deviation from the straight line of travel.

The illustrations are typical examples of the use of conveying apparatus and of special machinery at the plant of Henry Ford & Son, Dearborn, manufacturers of the Fordson tractor. The gravity conveyor system is



Four-way drill with 59 spindles operating on the Fordson cylinder block. This drill, made by the Foote-Burt Co. of Cleveland, Ohio, is capable of handling 25 blocks per hour. It requires only one man to operate the machine, which can be placed very close to the conveyor



A three-way taper made by the Foote-Burt Co. of Cleveland, capable of handling 30 Fordson cylinder blocks per hour and tapping in three directions at the same time

used here to advantage, and there are a number of special machines of which those shown are very good examples.

The rotary milling machine shown is a product of the Ingersoll Co. of Rockford, Ill., and is capable of handling six blocks at one time, milling both ends of the block. In place of the reciprocating table, which is the cause of much loss of time in returning idly, this machine has a continuous rotary table which practically eliminates the loss of time due to setting up. Besides this, the machine takes both the roughing and finishing cuts. The two sets of milling cutters are apparent in the view of the machine. As will be noted, the machine itself is compact and can be set very close to the conveyor system, requiring little deviation from the conveyor line in order to place the block on the machine. The cylinder blocks shown are for the Fordson tractor engine, and it requires

only 3 min. for a block to be completed on the machine. When once started, the machine is run continuously, there being a constant feed of blocks to the milling cutters.

The rotating table gives continuous motion because it is always proceeding in one direction and there is no necessity for the quick return movement common on reciprocating table machines.

Another special machine the use of which tends to keep the work close to the conveyor system is the four-way drill. The gravity conveyor used for passing the work along is shown in the foreground and the machine is directly behind it. The four-way drill has 59 spindles and is capable of handling 25 of the Fordson cylinder blocks per hour. The machine is a product of the Foote-Burt Co. of Cleveland, Ohio. It is handled by one man, and once set up is a simple machine to operate, because it is merely a matter of alignment with the jigs. Of course a machine of this kind must be so designed and laid out that the dangers of drill breakage are practically nil, because it would be very poor efficiency to have the entire 59 spindles held up due to the failure of one drill. This is a matter of speeds and drill quality, and the problem is readily solved by keeping the factor of safety just as high as possible on machines of this kind.

In using the gravity conveyor there are opportunities for placing inspectors at strategic points where they will be able to perform their work without interfering with the machines. One of these points is where the conveyor turns a corner, such as is

illustrated. This particular illustration shows the inspector on the finished cylinder blocks, who can use his gages to advantage because he is located at a corner of the conveyor. This gives him free arm motion on both sides and allows him to work on either the end or the side of the blocks. The gaging operations performed at this point are checking the bearing diameter and the amount of metal on the face of the cylinder casting.

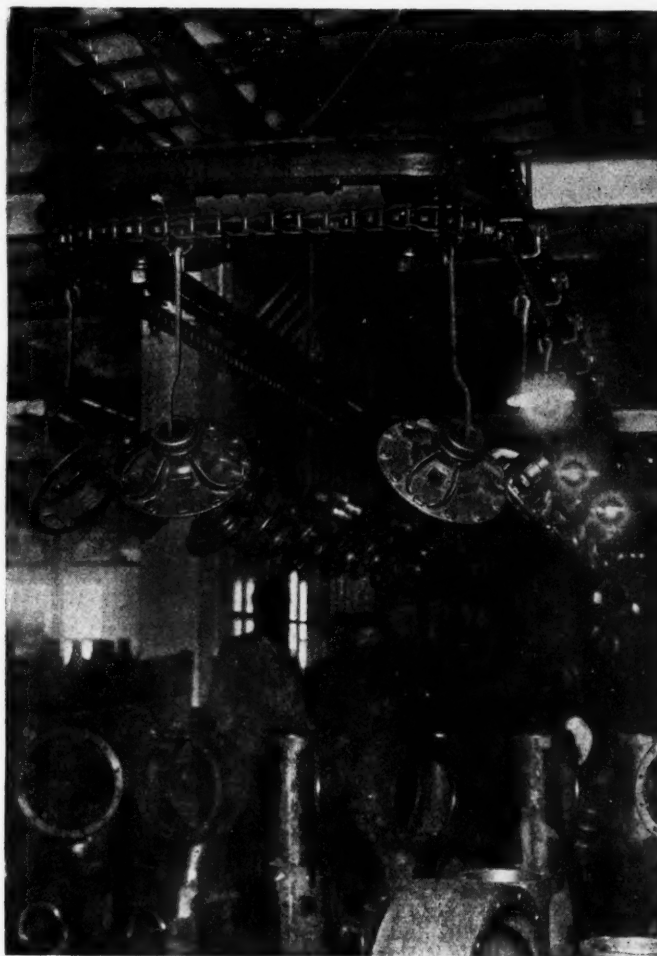
This particular inspection requires about six gages, which can be quickly used and the block pushed along at right angles to its previous course. This conveyor is the same as that shown in previous articles on Ford assembly methods, and illustrates the manner in which the cylinder blocks are brought directly to the assembly department without any intermediate storing operations in the finished parts stockroom.

Where the parts are not large enough to necessitate the use of a gravity conveyor and where other forms of chain conveyors fail, an overhead system such as illustrated can be used to advantage for bringing the work to the machines. The castings shown hang on hooks from an overhead chain carrier which passes around, bringing the work to the various machines. The operator on a machine simply reaches up and takes off a casting, performs his operation on it, and then hangs it back on the hook. When all the operations are complete, or at periodic intervals, the castings are removed from the hooks and placed on the conveyor, which travels down into the assembly department. In the foreground of the illustration showing these parts on the overhead chain can be seen finished transmission housings for the Fordson tractor, which are end to end on the gravity conveyor on the way to the assembly department. Thus it is apparent that with this overhead chain system it is possible to pass underneath with the regular gravity roller conveyor, and there is no trouble in the two lines crossing each other, as would be the case were they both on the same level.

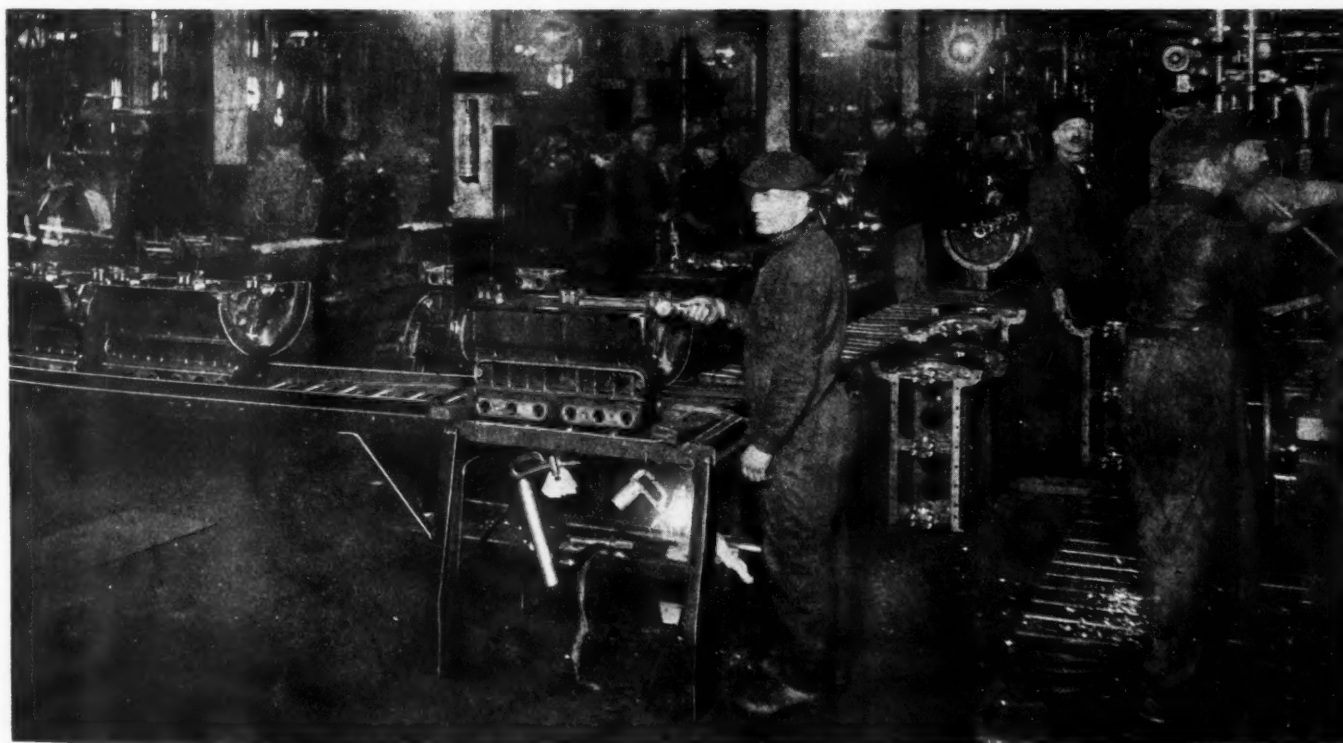
Sub-Assemblies Handled as Feeders

Feeding into assembly lines and manufacturing lines are always sub-operations which cannot be put in the continuous progressive system, because to do so would make the progressive line too long, or would complicate manufacturing problems. The solution for problems of this kind is to handle sub-assemblies or sub-manufacturing operations as feeders and allow them to come in as branches of the main line. The sub-assembly work shown on the worm wheel is a good example of this; the arbor pressing operations and electric drilling work can readily be handled to one side of the main assembly line, and the sub-assembled parts can then be sent along the gravity conveyor to the main line, reaching there at a point where the parts are required.

This method of handling the work is in common use at the Fordson factory and works out very well, indeed. The parts for the various sub-assembly jobs, such as



Overhead chain carrier used to bring the work to the machines and to eliminate storage on the floor. In the foreground are transmission housings on a gravity conveyor crossing the overhead line



Inspector stationed at a turn in the conveyor line. This insures freedom of motion in all directions



A sub-assembly feeding line by means of which the worm wheels and axle shafts on the Fordson tractor are sub-assembled and fed to the main assembly line. The arbor press operation is shown to the right of the illustration. Note the method of supporting the electric drills overhead

bolts, cap screws, etc., can be placed in pans beneath the gravity conveyors or racks, so that it is possible for the workman to always have a supply at hand. There is the objection of stooping for these parts; but whether or not that objection is serious depends on the number of pieces to be picked up and the possibility of putting a small supply at hand on a level with the job.

These random examples of methods in keeping the progressive line to a straight geometric figure are typical of the way the work is handled at the plant of Henry Ford & Son, Dearborn. The methods are those which should be adopted by any shop which is making a special

study of motion efficiency, as both by the use of special machines and by the use of conveying apparatus which brings the work close to these machines and holds it to the preconceived line, the deviations are kept at a minimum and the total amount of travel of the work is kept as low as possible. After all, the efficiency of manufacture can be determined quite closely by the total distance traveled by the piece in its progression from a raw part to finished stock. The story can always be told by studying the distance traveled, and good conveying systems and wisely chosen special machinery will reduce this total travel to a minimum.

Exide Tractor Type Batteries

THE Electric Storage Battery Co. of Philadelphia, manufacturer of the well-known Exide batteries, has made a careful survey of the tractor field, and as a result has reached the conclusion that, while passenger automobile batteries are not adapted to this service, there are no conditions which cannot be met by a properly designed battery. It has therefore brought out a complete line of tractor type batteries.

These batteries have been subjected to the most severe shock and vibration tests, and have withstood these tests successfully, we are informed. The plates are very heavy and of rugged design. The separators are of the combination treated wood and perforated hard rubber type. This separator combines the good points of wood and hard rubber, and is employed where the conditions are very severe, as, for example, in mine locomotive service. Plate groups are supported on strong rubber bridges, an additional protection against shocks or vibration. Jars and covers are of Giant compound, and breakage is said to be practically eliminated. Covers are of the double-flange type, permitting effective sealing. With this construction,

the cover supports the top of the jar from the outside as well as the inside, so that it cannot break away from the seal, and thus a permanently tight joint is rendered possible.

Elements are proportioned to fit the jars tightly, and extra heavy sealing nuts are used on the pillars to anchor them in place. Jars are set in compound in the carrying cases, and as an additional precaution the latter are equipped with through bolts so that the sides can be drawn together, holding the jars firmly in place.

Intercell connectors are of flexible copper, to prevent crystallization and consequent breakage under severe vibration, and are lead-plated to prevent corrosion. Terminal connectors are standard clamp lug type.

The initial cost of the Exide tractor type batteries is somewhat higher than that of the automobile type, but it is claimed that from the standpoint of service they will prove considerably cheaper, as the rugged construction employed will not only result in greater reliability and freedom from trouble but also in a much longer life.

Airplane Supply System of the American Army in France

(Continued from page 989)

and until the necessary machinery and organization have been brought into existence no amount of enthusiasm, no amount of punch, will produce tangible results.

France possessed the machinery and the organization as the result of three years' intensive effort under war conditions. America was just getting her machinery and organization together, and having to learn, as all those before her had learned, by her own mistakes. Until the American machinery could be put into motion, the best, indeed the only sensible plan, was to intensify the output of the French machinery to such a degree as to enable it to supply the American army's needs.

Consequently the moribund contract of Aug. 30, under which France was to supply America with 5000 airplanes, was wiped off the slate and a new contract was entered into between the French and the American Governments, by the terms of which France was to place at the disposal of all the large American units, such as army corps, divisions, etc., the same aviation material in quantity and quality as if corresponding French units were involved. This contract, which was put through in six weeks' time, went into effect on May 3, from which date the American Air Service got into its stride and went ahead at an increasing rate. As France was going to be the temporary furnisher of aviation material to the American army, and as 90 per cent of the French aviation industry was stationed in and around Paris, it was necessary that Paris, and not Tours, should be the headquarters of the Supply Section of the American Air Service.

In order to fully appreciate the difficulties under which the early work had to be carried out in France, it must be understood that it was not known by anybody how big an army America would have, whether the United States troops would operate as a separate army, or whether they would be attached as units to the various Allied armies. In other words, an Air Service had to be created to meet the requirements of an army of unknown size and nature. When, in the spring of 1918, Germany began to drive home her crushing and, as she hoped, final blow, and in consequence the Allies had to send an urgent appeal to America for immediate assistance in

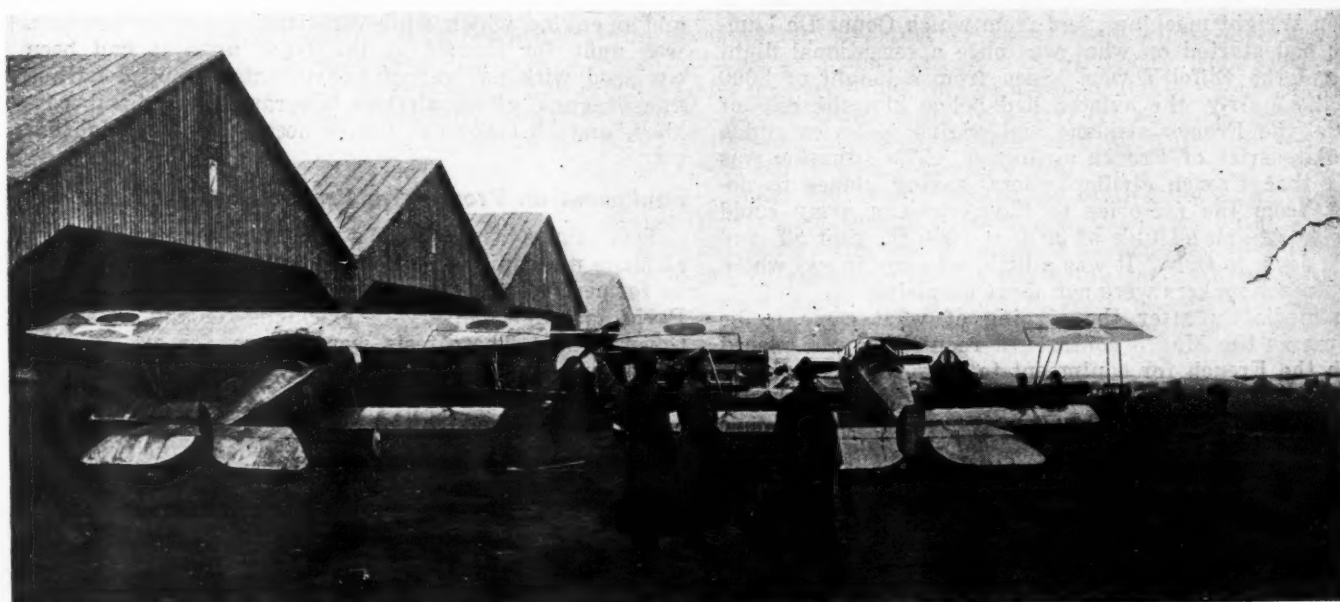
the field, the task was thrown on the Air Service of meeting big, urgent, deadly pressing calls.

Without in any way deprecating the importance of the preliminary work which had been carried on up to that time, it may be stated that the Supply Section of the Air Service took off its coat and rolled up its sleeves in the spring of 1918 and had no time to wipe away the perspiration until the unexpected armistice called for a halt on Nov. 11. It was during that period of nine or ten months that practically the whole of the 46 squadrons were formed, sent into the field and maintained there, and that the 6625 airplanes were obtained for the A. E. F.

All the airplanes built for the French army in the factories located in and around Paris were sent to the big depot at Le Bourget, on the eastern suburbs of the city, where they were completely equipped and despatched under their own power to the front. As France was to meet the needs of America until the home factories were in a position to produce, it was quite natural that space should be reserved for the American Army at Le Bourget. Germany was evidently fully aware of the great importance of the French air depot on the plains to the east of the city walls, for on several occasions she sought to destroy it by aerial raids, and during the month of March made a big concentrated night attack during which considerable damage was done. Among the machines destroyed were a number of Spad fighting planes for the American army.

Orly Field Established

As a result of this attack, the French decided on splitting up their own forces and gave orders for the American service to evacuate Le Bourget without delay. While the original cause of this removal was unfortunate, the outcome was most satisfactory, for faced with the necessity of securing its own quarters, the Supply Section of the American Air Service decided on the construction of Orly Field, the importance of which to the A. E. F. cannot be overestimated. On the main road from Paris to Fontainebleau, about 8 miles south of the former city, there lay a series of absolutely level fields, given over to farming, but devoid of hedges and ditches and con-



Nieuport airplanes used for training American pilots in France



A part of the American city built at Romorantin

sequently easily convertible into an air depot and flying ground. Within five days the American Air Service was authorized to take possession of this ground. This constituted a record, for usually these requisitions cannot be put through in less than six weeks. If any incentive to quick action was required, it was to be found in the threatening German activities on the Somme, accompanied by air raids and long distance bombardment of Paris, which began about that time.

On March 31 the Sixth Company of Motor Mechanics Regiment came up from Tours on 25 trucks, established themselves on the field, and began to lay the foundations of an air depot which six days later was able to receive the first airplanes from the French factories, and within three weeks to despatch the first planes from Orly to the front. When this ground was taken over it consisted of monotonously level fields without a building on them, with a fine granite paved road running through them, with convenient railroad lines, with the River Seine on the eastern edge, and just to the south the old Juvisy airdrome, where the first Frenchmen had learned to fly on Wright machines, and from which Count De Lambert had started on what was once a sensational flight around the Eiffel Tower. Seen from a height of 3000 ft. above Orly, the aviator had below him the city of Paris, the French airplane and engine factories and a regular series of French airdromes. The situation was such that French civilian pilots, having planes to deliver from the factories to the American army could climb up to an altitude of 2000 or 3000 ft., shut off, and glide down to Orly. It was a little economy in gas which the French makers were not above despising.

Immediately after the signing of what came to be known as the May 3 contract, a requisition was placed with the French for equipment to meet the needs of 94 squadrons, the supply of this of course to be spread over a rather long period. The French lived up to the spirit of this contract in a whole-hearted manner. Not only did they change all their production plans, but they altered all their arrangements at the front in order to meet the requirements of the American army.

Orly was designed with a capacity of 25 planes a day, but under the urgency of the calls from the front and in order to meet the rapidly increasing requirements of the

army, it worked at all times beyond this capacity. By the middle of the summer it had established the record of 91 airplanes despatched on one day from this ground for the front, and from the end of March, when the agricultural fields were taken possession of, to the eleventh day of November there were sent out of Orly a total of 1800 planes. The ferry pilots who took these planes up to the front covered a total distance of 403,000 miles, equal to sixteen times around the world. This big mileage was obtained with a total loss of six lives, although owing to the extreme urgency of the calls it was often necessary to order deliveries to be made when weather conditions were unfavorable, and to give to pilots machines with which they had had little previous experience.

Although the French Government undertook to meet the immediate needs of the United States Government, this did not imply that the American Air Service had to sit by with folded arms and watch the planes come in. Under the contracts French makers delivered airplanes in about the same condition as automobiles were delivered ten years ago. The finished article consisted of a plane and an engine, which, while constituting a flying machine, was unfit for service at the front until it had been equipped with navigating instruments, supplied with a gun or guns, given wireless telegraphy sets, bomb carriers, and all other auxiliaries necessary for a fighting plane.

Equipment on Progressive Production Plan

Test groups composed of a pilot, a group inspector, an airplane mechanic, a motor mechanic and a clerk had to be formed to go to the various French airdromes around Paris and take delivery of machines for the American Government. These tests were severe, for out of 3394 planes presented by the French only 2126 were accepted immediately. Five hundred and ninety-seven planes were accepted after one rejection, 191 were accepted after two rejections, and a few were only admitted after six rejections. In all 1814 planes were rejected at various times, and of these 399 were never accepted. In carrying out this work the pilots made more than 5000 test flights.

Orly field, with its 78 hangars and scores of other buildings, its miles of cinder track and acres of perfect flying ground, was laid out on a progressive factory

system, with the sheds at one end for receiving new planes, and the other buildings in proper order according to the equipment to be added. In the first shed the plane would receive its navigating instruments; moving along, it would get its wireless equipment, if designed to receive this; next it would get its gun or guns, and would be taken up to the firing butts to be tested for accurate mounting of the gun and for synchronization. As it moved from shed to shed each machine was tested and reported on, until finally it went out for its final test flight fully equipped.

Having been pronounced perfect in every respect, the machine would take its place on the starting line marked across the field, from which point 25 to 90 machines were despatched to the front every twenty-four hours. On an average this work of receiving, equipping, testing and dispatching a plane to the front occupied two to three days. All the machines included in the initial equipment of a squadron went out complete with every requirement. Of the replacements sent out to make up losses due to wear and tear and enemy action, 50 per cent were completely equipped, and 50 per cent without equipment, for out of the crashes it was always possible to save some of the accessories.

At the time of the armistice Orly had a staff of 323 officers and 2283 enlisted men who were living on the field in sheds and buildings erected by the American army. This work of erecting buildings and fitting up machinery had to go on concurrently with production.

Every foreign airplane intended for the American Service had to pass through Orly. As the great majority of these machines came from French factories, they had to be flown but a short distance; but England and Italy also contributed, and their machines came under their own power to Orly. The Italian machines had to be flown over the Alps, and in order to meet these conditions the Italian Government constructed an emergency landing ground on top of Mont Cenis pass, 9000 ft. above sea level.

American Planes Fitted Out at Romorantin

While this big effort was being exerted in conjunction with the French, an equally big program was being developed for the reception of airplanes from America. At Romorantin, a little town situated on that all-American line from the Atlantic to the Vosges, there was established in early March what was officially known as Air Production Center No. 2. The French authorities turned over to the Air Service about 50 acres of thinly wooded or barren land, and on this there was erected within a period of 10 months a real live American city with 2,900,000 sq. ft. of constructions, 36,000 lin. ft. of made roads, 55,000 ft. of railroad, nearly 8 miles of water line and about 5 miles of drains, and adjoining it a flying field of 425 acres of prepared ground, the whole receiving a personnel of 12,000 officers and men.

Romorantin's duty in the scheme of supplying the flying forces was to receive American-built airplanes, to assemble them, to equip them, and dispatch them to the front. In addition to this it had to provide for all spares and replacements of planes, engines and airplane equipment. It had to receive all wrecked planes sent back from the front, repair them or salvage them, according to their condition.

The preparatory work, which consisted of clearing the ground and erecting buildings, began in early March, 1918. Lumber was scarce, machinery and equipment were not coming in from America and were hard to find on the French market. All that month of March the preparatory work went on and by the beginning of April

work was sufficiently advanced for starting on preparations for the assembly of American-built planes then reported to be on the water.

It was on April 11, 1918, that the first American-built DH-4 airplane, designed to be flown with a Liberty engine, was unloaded from the American freight cars running over the American-built railroad line from Saint-Nazaire to Romorantin, and one week later this same plane—the first of a big and ever increasing series—was ready to make its trip over the lines into Germany.

From that time to the signing of the armistice Romorantin worked steadily, day and night, on the task of receiving, assembling and dispatching American-built airplanes to the armies in the field. Between May 11 and Nov. 11 there were sent out of these huge shops 1213 American planes, all equipped with the Liberty engine. Of these planes 1087 were in active service over the lines, and 67 were in hand for delivery when Germany threw up her hands.

Romorantin enjoyed an ideal geographical situation. Almost in the center of France, right on the main line of communication, it was yet sufficiently far from the fighting line to be undisturbed by enemy action. These 200 miles had to be covered by the planes under their own power, deliveries being made by ferry pilots, as in the case of the foreign planes sent out of Orly. Notwithstanding the distance, only 5½ per cent of the planes were crashed during delivery, and of these accidents 25 per cent were due to fog, rain or other climatic conditions beyond the control of the pilot.

Sixty Planes a Day

Assembling and shipping new American planes was the biggest but not the most difficult, of the tasks intrusted to the staff at Romorantin. The size of the job can be judged from the fact that in one day 60 airplanes were flown from Romorantin to the armies. Up at the front, at Chateau-Thierry, in the Argonne, in Champagne, east of Dunkirk, wherever American aviators were operating—and they were to be found all along the line from the North Sea to the Swiss frontier—planes were smashed and were being sent back to Romorantin for treatment. During those eight months of heavy fighting Romorantin received 1184 airplanes which had been so damaged that the squadrons and parks at the front were unable to handle them. Of these planes 899 were American and 295 were of foreign origin. Out of this total 101 American planes and 207 foreign planes were salvaged, and 756 American planes and 40 foreign planes were repaired and delivered into service again, making a total of 796 airplanes returned to the army. In addition, when the armistice was signed there were 52 American and 48 repaired foreign planes on hand.

Under war conditions the life of an aviation engine is short. Each squadron in the field is equipped with limited repair facilities and is supposed to carry out work which can be executed without impairing the mobility of the organization. But in order to make possible any extensive amount of repairs it is necessary to provide each unit with a considerable stock of spare parts. But in France spares, whether for airplane engine, airplanes, or for automobiles, always have been exceedingly difficult to procure. French makers always preferred to build complete units rather than spares for the same, and from America there always seemed to be more difficulty in getting spare parts shipped to France than in securing whole engines. In consequence of this, Romorantin was made the great center at which aviation engine repairs should be carried out. When there was a defect which the squadron mechanics could not immediately remedy,

the engine was put aboard the railroad car and sent back to these centralized shops for treatment, its place being taken by a replacement which might be new or overhauled.

In considering this work it must not be imagined that the aviation material could be divided into American and foreign. While the United States practically limited itself to one type of engine and plane, the European material which had to be received and operated on comprised 41 different types of airplanes and 23 different types of engines. Before they landed in France not one man in a thousand had seen a foreign plane or even had the opportunity of reading a description of a modern airplane engine. Men had to be trained to fly these different types of planes; riggers had to learn to erect and adjust them. Mechanics had to study each different type of engine, to know how to repair them, assemble them and adjust them. Among the technical personnel were many first class automobile mechanics, but few if any of these had seen a foreign aviation engine before donning the uniform, and yet they had to handle such

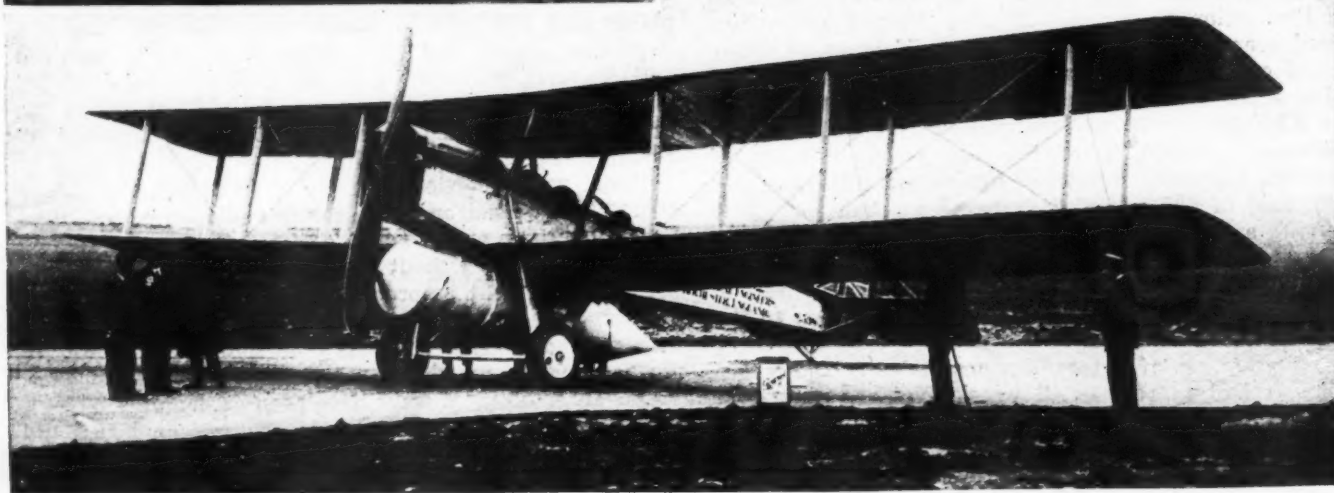
different types as the Renault, Rhone, Gnome, Fiat, R. A. F., Anzani, Beardmore, Hispano-Suiza, Salmson, Clerget, Lorraine-Dietrich and Peugeot.

To get deliveries of these foreign engines and planes necessitated negotiations with the Governments of France, England, and Italy, and even business connections with such neutral nations as Spain and Switzerland. This meant that hundreds of men who up to the outbreak of the war had never been outside the United States, had to make themselves acquainted with foreign business methods and handle one of the most highly specialized and technical subjects in a foreign language. Had any private business concern in America considered the possibility of a European business of this magnitude, it would doubtless have spent two years in laying plans and picking out a specialized personnel, before attempting to do any real work.

The call on the Supply Section of the Air Service fluctuated with the severity of the fighting. The course of the war might be followed merely by examining the diagrams of requisitions and deliveries. But from March to November, 1918, there was one continuous battle, and consequently one continuous call, with minor fluctuations, on the Supply Section. At Romorantin alone there were received in seven months 50,000 tons of material and distributed 17,000 tons, or a daily average of 322 tons. Among this material were 2600 propellers received and 1600 despatched; 1526 airplane wings received and 1039 sent out. The greatest strain came in the month of August, when the Supply Section sent out to the armies in the field a total of 950 airplanes.

The two big centers, Orly and Romorantin, were dependent on the base ports for their supply of material. From a military standpoint the whole of France and a small portion of England were divided up into zones, which comprised the various Base Sections, the District of Paris, the Intermediate Zone, and the Zone of Operation. At all the big base ports there were aviation officers and men whose duty it was to receive material and get it through as expeditiously as possible to its destination, which might be Paris or Romorantin or in extreme cases the Intermediate Zone.

(To be continued)



British Airplane Which Attempted Transatlantic Flight

THE Short Bros. biplane which fell into the Irish Sea on its attempt to fly across the ocean with Major Wood as pilot. The machine originally was built to carry a giant torpedo for attacking the German fleet. An aluminum gasoline tank with a capacity of 600 gal. now takes the place of the torpedo. The wing span of the machine is 34 ft. and it is fitted with a Rolls-Royce engine of 360 hp.

The International Labor Convention Analyzed

A Manifestation of a Common Purpose Among Labor Organizations of the World—The Nine Clauses and What They Indicate in the General Tendency of Labor Affairs

By Harry Tipper

LAST week there was printed in AUTOMOTIVE INDUSTRIES a summary of the Bill of Rights which was approved by the International Commission on labor legislation containing nine clauses that are proposed for insertion in the treaty of peace. The additional information which is available contains the text of the organization machinery by which the International Labor Conference is to function and through which its operations are to be made effective.

While this convention is not likely to become effective immediately and is not concerned in the present operations of a manufacturing plant, it is sufficiently important in its departure from precedent, in its indications of a common purpose among the labor organizations of the various countries and in the conditions of its recommendations, to make it worth while to examine the matter with some comment upon the developments.

Nine countries participated in this Commission: the United States, the British Empire, which, however, includes Canada, Australia, New Zealand and South Africa as self-governing colonies, France, Italy, Japan, Belgium, Cuba, Poland and the Czecho-Slovak Republic. This means that the most important manufacturing countries outside of the central countries of Europe, were interested in this International Labor Conference.

It is significant that while the main peace conference has been disturbed by the difference in national aims and the difficulty of their adjustment by the jockeying of political bodies, the International Labor Conference has gone ahead and with little trouble apparently has drawn up the nine clauses which constitute the Bill of Rights for incorporation in the treaty of peace.

We have had occasion to remark a number of times that labor knows how to co-operate in organizing for common purposes better than any other section of the population, and it is evident, from the conclusion of this conference, that the representatives of the different countries on this International Labor Commission have seen the necessity of establishing similar labor regulations upon certain broad lines if the international competition was not to interfere with the improvement of the condition of labor in the more populous and more advanced countries.

The actual Bill of Rights which has been presented for inclusion in the peace conference contains items which are of importance on account of their indication of the general tendency in labor affairs and their influence upon legislation in this country.

There is a specific clause dealing with this question admitting that employers and workers alike are allowed the right of association for all lawful purposes. Of course, this has been tacitly recognized by most manufacturing groups in this country, although this recognition has not

taken the definite and effective form which it has taken in Great Britain. There are still a good many employers who question the right of the worker to organize and there are a great many groups of manufacturers who are still attempting to destroy the labor organizations with which they are concerned.

The recognition of the right of association and the recognition of its place in the relations between capital and labor must come definitely in the near future in any case, and, therefore, this clause in the treaty is merely a consolidation into the treaty of peace of the general opinions prevailing in the countries concerned.

Child Labor

Because of the control of labor regulations within its borders by each State in the Union, and the difference in public opinion in the different States, there has been no unanimity in the regulations concerned with the question of child labor in this country, and in this respect the United States is considerably behind the more important countries in Europe. Of all the matters pertaining to labor which can become the subject of State or national regulation, the conditions under which children may enter industry are the most important. The health, the education, and the outlook of the children directly affect the productive capacity, the political ideas and the social incentive of the mature.

In Great Britain the physical effects of the period in the middle of the nineteenth century, when factory work was done by thousands upon thousands of young children, is not yet eliminated. The physical deterioration, due to this industrial nearsightedness, is one of the difficulties which are affecting that country.

It should be considered, however, that the regulations in respect of the employment of child labor in Great Britain are to-day very strict, and the United States, as the most important industrial country in the world, has no definite policy in connection with this matter. It will become necessary for this country to decide, if this Bill of Rights is included in the treaty of peace, whether its ratification will include the three clauses which specifically regulate the employment of children in industry or commerce.

The Right to an Adequate Wage

Those clauses which deal with the right of labor to secure a wage adequate to maintain a reasonable standard of life are important more for the definition of this item than for any change which it would mean to industrial practice in this country, at any rate, in the metal trades and machinery industry, where the condition of the worker has been established on a basis which gives each worker this adequate wage on the basis stated.

The following clause, however, which deals with the pay to be given to women workers is of considerable importance to the machinery industries which have begun to employ large numbers of women workers, particularly since the war broke out.

This clause demands equal pay to women and to men for work of equal value in quantity and quality. Under the present system of handling labor pay, it has been customary in a good many plants to secure women workers for a reduction in the wage for given classes of work from that required by men working at the same job. The practice in this respect would be altered if the various States in this country decide to ratify this clause in the treaty.

The only other item of importance in this array deals with the demand for a weekly rest for all workers and the limitation of hours to eight hours a day, or 48 a week.

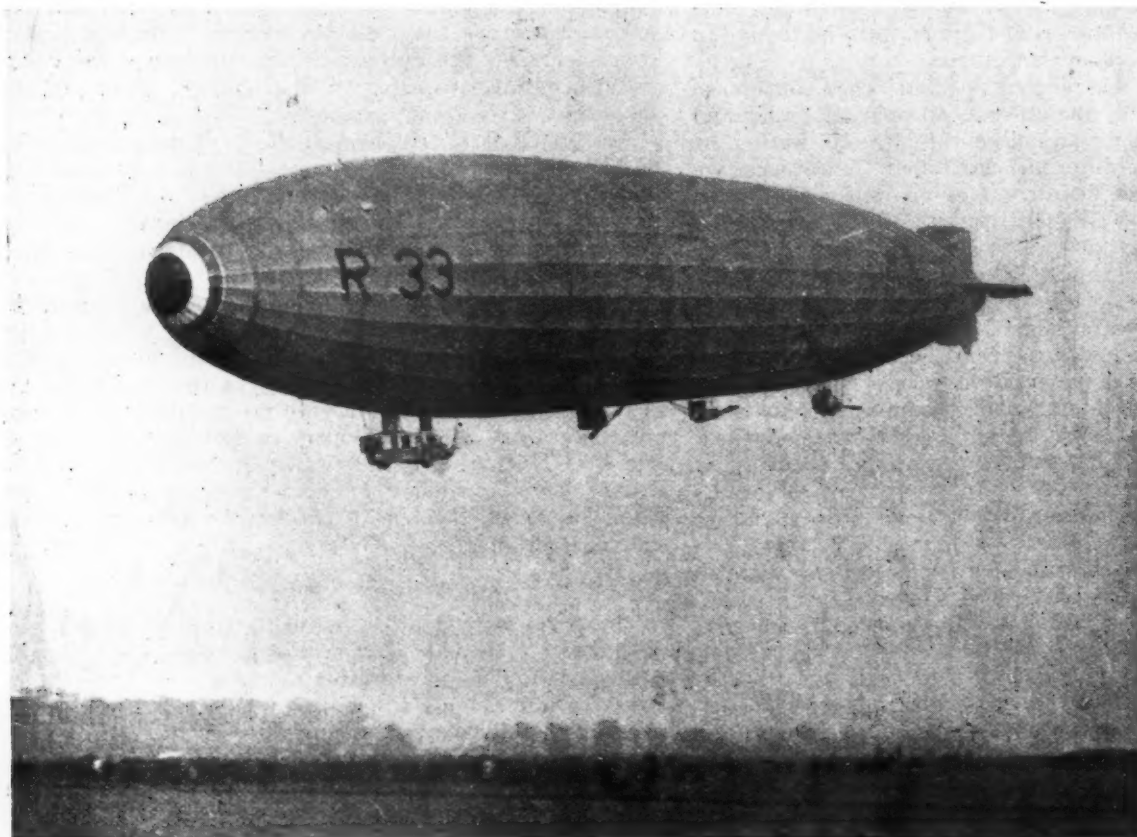
The machinery of organization proposed in this International Labor Commission provides that the recommendations of such International Commission shall be treated in the case of a federal power as a recommendation only, where it is impossible for the Government to enter into a draft convention. This means that on labor questions, which are under the control of the various states in this country, most of the provisions contained in the Bill of Rights would have to be treated as recommendations only and recommended by the national government to the states for adoption. They are not of importance, therefore, as indicating any immediate or pending action on the part of the government in this country in its agreement with the Allies as to peace terms, but they are of importance in indicating the solidarity of the aims of labor in the various countries, the recognition of certain general regulations which must exist internationally if the labor position is to be safeguarded and the strength which can be used by the labor bodies in the various countries in the attainment of these provisions which they are convinced are internationally desirable.

This whole report should convince the manufacturer of

the power which has been secured by the worker during the war and which has changed the conditions to which the industry must look forward and to which its operations must be adapted.

It is evident that the inclusion of this Bill of Rights in the treaty of peace would bring these nine clauses definitely into the political arena in this country and make them matters which must be decided either one way or the other by the political bodies. Such an event would also initiate the action of the various states upon regulations of a uniform character and have an additional political, civic significance in that way. Whether these clauses are actually adopted in the making of the final treaty and whether they become operative in this country in due course after that time or not, the attention which has been given to them by their recommendation to the peace conference from the International Labor Commission will bring them into prominence and undoubtedly reinforce the propaganda which has been established already for the passage of some such regulations.

Manufacturers in the automotive field will do well to watch the tendency now exhibited in various states in this country for the promotion of legislation of a regulatory character on labor matters, such as the bills which were brought before the New York State Legislature for a minimum wage and a definite working day, considering this increased tendency toward legislative enactments in their decisions as to their own policy toward their own workers and toward their own organization plans. It is desirable that as many of these questions be settled between the owners of the industrial organization and the workers within that organization and that as few of them be left to regulation as may be. The extent to which regulation is demanded will depend very largely upon the extent to which the manufacturer takes these things into consideration and considers his organization plans and his own policy in his own plan with due regard to the tendency of public opinion and the general attitude of the labor bodies as shown in their demands and agreements.



R-33

*British rigid
dirigible on
trial trip*



Direct Selling in South America*

A Careful Study of Markets and Trade Conditions Essential—Selling Through Branch Houses, Traveling Representatives and by Mail—The South American Merchant—Terms and Credit

SOUTH AMERICA is one of the world's greatest potential markets. Its resources are enormous. It is awakening to its great commercial opportunities, and its future development promises to be rapid. Our country should participate in that development to the extent of its ability. During the war, with European markets largely cut off, South American business was thrown at our feet, but this condition will not continue much longer. European manufacturers are alert to the possibilities of this market, and it promises to be one of the most hotly contested in the world. Our share of the business will depend almost entirely on the efforts which we make to retain our present customers and develop new ones. If American manufacturers will awaken to full appreciation of the importance and magnitude of the South American market, and make wholehearted efforts to develop it, there is no reason why we should not retain and increase in this field the leadership which the war made possible.—P. S. STEENSTRUP.

MOST products marketable in the United States can be sold in South America, but the country is so large and trade conditions so varied that a very careful study of conditions should be made before a selling campaign is launched.

There are three different ways of direct marketing: First, through branch houses; second, through traveling salesmen; third, by mail, through the use of letters, catalogs and samples.

Branch houses are not desirable for the small manufacturer or the manufacturer with limited sales; neither are they profitable for the manufacturer who is interested in foreign markets only when he has a surplus of products and forgets all about overseas business when the domestic market is able to absorb all the merchandise he produced.

For the manufacturer with ample capital and a staple product for which a large and sustained demand can be created, the branch house is the best selling method to employ in developing South American markets. The establishment of a branch house makes your business a part of the country and community, and gives you a standing which cannot be obtained by other methods. The South American, like the European, is favorably impressed by the appearance of permanency and he likes to establish business relations on a more or less permanent basis.

Branch House Essentials

The location of branch houses should receive careful consideration. If inland, they should be on a good railway or near as many different transportation systems as possible. The locations should be selected only after careful consideration of the markets which the branches would serve, labor conditions, local taxes, etc. The initial expense incurred in establishing South American

branches is much greater than the cost of similar ventures in the United States. Many different forms of taxes and gratuities must be paid, and traveling expenses are much higher than in this country.

The selection of a branch manager is very important. He should be familiar with the languages, customs and business methods of the countries in which he is located, should have a thorough knowledge of his product, and command the confidence of his house. Unlike the American branch manager, who is in almost daily contact with his home office, the manager of an overseas branch is almost entirely on his own resources. He must be competent and resourceful and be able to make decisions on important questions without the delays incident to communication with the home office.

If market possibilities or finances do not justify the expenses and risks incident to the establishment of branch houses, the next best way to market your product in South America is through traveling salesmen and exclusive representatives.

Traveling Representatives and Local Agents

Great care should be taken in selecting your traveling representatives. Although good men are scarce, traveling is so expensive that you cannot afford any other kind. An unsuitable traveler is a very costly investment. Men developed in your own office will probably be found most satisfactory. They should know your product thoroughly, should have a good conversational knowledge of Spanish and Portuguese, or Spanish and French, and be dependable and adaptable. Personality and breeding are important in the South American field. Friendship is a valuable factor in business, and the exchange of social courtesies is an essential preliminary to the opening of business relations. Do not expect your representatives to show immediate results. It takes time and patience to establish a profitable business in South America and manufacturers who are not prepared to spend the time and money necessary for development work should not attempt to enter the markets.

In the appointment of local representatives or distributors great care should be used in the apportionment of territory, and also in the selection of the business houses. Only as much territory should be allotted as a distributor is able to cover thoroughly. While old-established business houses often make the best representatives, a young, aggressive firm with less capital than its older competitors, but with much more initiative, will occasionally get the larger volume of business.

After a distributor is appointed he should receive all possible co-operation from the manufacturer. Literature in the language of the country without prices, or with prices quoted in the money with which his customers are familiar should be furnished. Periodical advertising campaigns should be provided and all possible assistance and encouragement given the distributor to promote the sale of your products through modern, aggressive sales promotion work.

Many American merchants and manufacturers whose salesmen have never been south of the Rio Grande have by mail built up substantial and profitable trade relations with South America. The larger mail order houses are doing a large volume of business in this territory, and many of the larger New York department stores are receiving orders from the wealthy South Americans. Our export publications are now carrying advertisements of practically all known commodities from pins to locomotives

*Abstract of a paper read before the Sixth Foreign Trade Convention by Mr. Steenstrup, who is general manager of the General Motors Export Co.

and many of the advertisers never have had traveling representatives in South America.

For the merchant or manufacturer who does not wish to incur the expense of sending out traveling representatives, the mails offer a comparatively inexpensive and frequently effective medium for developing South American trade. Advertisements in our export publications bring good results; and if desired, this form of advertising may be supplemented by circularizing lists of prospects, which may be obtained from daily commerce reports, foreign trade directories, business associations, banks with South American branches, United States consuls and the companies which furnish lists of various kinds. Advertising matter for use in a direct-by-mail campaign of this kind should be prepared with the greatest care. Catalogs and circulars should be well illustrated, printed in idiomatic Spanish, or in Portuguese if for distribution in Brazil, and when prices are quoted they should be in the money of the country in which the literature is distributed. All inquiries should receive prompt and careful attention, and replies should be in the language of the correspondent.

Before exclusive agencies are granted, a most thorough investigation of the prospects and possibilities of the territory which the agent proposes to cover should be made. Sometimes a merchant handling competitive lines manufactured in European countries places a small order with an American manufacturer for the sole purpose of obtaining an exclusive contract and excluding the product from the market during the life of the agreement.

The South American Merchant

Business establishments in South America are of two kinds, native and foreign, with business houses owned by foreigners greatly outnumbering those owned by the natives, especially in the large cities. Many of the native merchants are Mestizos, of mixed Spanish and Negro blood, and their establishments as a rule are not equal to those maintained by the foreign merchants.

The merchants of South America may be grouped in five classes: 1. The general importers who correspond to the wholesale jobbers in this country. 2. Large retailers who import for their own account. 3. Large land owners or development companies who import. 4. The small shops and retailers in the cities. 5. The general stores, usually found in the rural districts and mining camps and corresponding to the general stores in this country.

As a rule, the South American prefers a small turnover and a large profit. He conducts his business in what to us seems a very leisurely manner. The shops in the cities usually open at 8.30 or 9 o'clock, remain open until noon, and then close until three. The most popular shopping hours are from three to six, at which hour most of the city stores close.

The business men, as a rule, are conservative and shrewd, careful buyers. They are well educated, polite and hospitable, with a high regard for music, literature and the fine arts. The South American likes to become thoroughly acquainted with you before he talks business, and in the smaller cities it is advisable to visit your prospect two or three times before your business is even mentioned. Appointments are quite frequently neglected and you will find it desirable to give your prospect plenty of time to make up his mind, because, while he is at all times courteous and hospitable, he greatly resents being hurried or persuaded against his will.

Packing Instructions Must Be Followed

When you receive an order from South America in which definite instructions are given regarding packing, marking and shipping, follow them explicitly. Do not permit your shipping clerk to ignore these instructions on the assumption that what is good enough for us is good enough for any country in the world. It simply will not do! Much of the dissatisfaction with our merchants and products in the past has been caused by failure to follow packing and shipping instructions.

A great amount of the inland freight in South America is moved by animal transport; mules, oxen, llamas and burros

are employed, and much of the travel is over rough mountain trails. The average load for these animals is: 100 lbs. for llamas, 150 lbs. for burros, and 200 lbs. for mules. When your customer specifies that his goods are to be packed in cases made of one-inch lumber and measuring not over 2x3 ft., there is a good reason for his not doing so.

On the West Coast of South America good ports are few and most ships are unloaded in the open roadsteads. The merchandise is discharged on lighters, which are flat-bottomed barges with vertical sides and a covering for rainy weather. Packages are lowered on to the lighters by the steamer crane, usually very carelessly. If the lighter is wallowing in a heavy ground swell, the load often strikes with a terrific impact. The necessity for secure packing in strong cases is therefore apparent.

Climatic Conditions Should Be Considered

The moisture, heavy rains and excessive heat should also be considered in preparing shipments, especially if the packages contain perishable articles. The best protection against moisture is a zinc or tin-lined case. Machinery and metal parts should be coated with oil to prevent rust. Pilfering is common in South America, and every effort should be made to make up the packages in such a way as to guard against this. When the packages are transported over numerous routes it is impossible to fix the responsibility for the theft, and there is slight possibility of recovery.

In making up shipments, the tariff classifications of the different countries should be considered. Do not pack in one case different classes of merchandise on which duty is assessed at different rates, as the duty is then assessed on the entire shipment at the highest rate.

Marks on cases should be simple, plain and legible; stencil marking is the best. Some South American countries prohibit receipt of shipments unless marked with stencils. The net, gross and tare weights should be plainly marked on each case, and when the shipment contains two or more cases they should be numbered consecutively.

Terms and Credit

Previous to the war South American merchants were granted liberal credit terms on all their purchases from European countries, and this was an important factor in the control of South American markets by European exporters. During the war American manufacturers have been demanding and getting cash in New York, but these terms must be liberalized if we are to get the maximum business from this country in the future.

The customary terms before the war were from three to twelve months' time. In fact, the German method was to ascertain what terms a merchant had been getting, and then offer him better ones. Credit liberality can easily be overdone, but there is no question but that the volume of our business with South America will depend somewhat on the terms we are prepared to offer.

The South American merchant requires credit for a number of good reasons. The resources of the country are, and will for some time remain, largely agricultural, and although the crops vary in the different countries, the merchants are called on to finance the native farmers; the same as our general merchants in the smaller towns. Bills are not paid until the crops are sold, and the merchant requires credit until he receives his money. Duty must be paid on practically all merchandise imported, and duty and ocean freight amounts to 25 to 75 per cent of the value of the goods. Stocks move slowly, and the merchants are required to carry large stocks on hand to take care of demand between shipments. Financing of some kind is essential, and as interest rates are high in South America the merchant usually prefers to buy where he can obtain credit terms at reasonable rates of interest rather than borrow money locally.

Your advertising copy should be conservative and descriptive of the merits and uses of your merchandise. Superlatives and bombastic or exaggerated statements should be avoided. The North American has a reputation as a "bluffer" in the Southern republics, and the class of advertising copy used by some of our merchants in South American publications has not done much to counteract this reputation.



The FORUM



Simplicity and Frankness in Industrial Relations

By Homer S. Trecartin

THE article by Harry Tipper in *AUTOMOTIVE INDUSTRIES* of April 10 is entirely too good to let pass without comment. It contains the germ of the truth which will have to be recognized and applied before a settlement of the whole controversy between employer and employee, between management and labor, will be arrived at. Mr. Tipper analyzes the question in a masterly way, but the subject should not be allowed to die or to remain dormant for a moment.

AUTOMOTIVE INDUSTRIES could do a great work by furthering in its pages a broad discussion of the subject which it has so ably taken up, that of industrial relationships. Mr. Tipper very clearly notes the tendency to a lack of simplicity in many of the plans which have been formulated by existing industrial organizations to bring about co-ordination of efforts and interest between workers and the management and employers and other concerns.

Nearly two years ago I assumed control of a manufacturing plant as the general manager. Certain profound beliefs and principles were firmly embedded in my mind as to the proper relationship between the employees in an organization and the management and owners of that organization. They were based largely upon the ideas that I had formed regarding the relationship that should exist between individuals in the very broadest form of association—that of the people and their government.

No Secrecy in Management

I applied these convictions and beliefs in my management of the company, and with very little compromise I was able to adhere consistently to them. What little compromise with the ideals was made was necessary, not from any inherent fault in the ideals, but because the ideals differed radically in some respects from prevailing custom. President Wilson had forcibly declared against secret treaties or secret diplomacy. I issued a plain decree in my small organization that there was to be no secrecy in it as far as the management end was concerned. It took eight or nine months to sell the individuals in the company this idea; the belief that secret conspiracies were an inevitable part of the management side of business were so deeply ingrained that it was necessary to talk it out of practically each man in the company individually.

Their belief in the efficacy of decisions kept confidential among the management was part of their training. As soon as a man was made a foreman he felt that he would no longer be able to take his fellow workers into his confidence about the details of his work. He felt that he was appointed partly because of his sympathy with the management and that there was implied the thought of confidential dealings with them. The superintendents had this idea; they felt that it was part of their job to conspire against the worker, that in business they were on different sides of the fight.

Not once but a dozen times did I call the whole organization together to enable me to tell them my beliefs and my principles that would actuate me in my management of the company, and in every talk, in almost every article I wrote for the magazine which we brought into being, in almost every notice which I had placed on the bulletin board, I had to dwell by direct statement or by suggestion upon this one big guiding principle—that there was to be no secrecy in the organization.

Complete transcripts of the proceedings of every foremen's meeting and of every conference of department heads, both of which occurred regularly once a week, were always typewritten and placed on the bulletin boards so that all could

have a knowledge of everything that transpired in these meetings.

A stranger came to me once with the appearance and manners of a successful lawyer and laid on my desk a complete report of one of the meetings of the union, which was very strong in our company and which I never in any way opposed. It was a typewritten record of everything that had occurred at this meeting, in which some radical pleas were made for an immediate strike by two or three of the men in the shop. They were radically opposed to the management and were evidently trying to incite the rest to combative measures.

This man told me that the organization which he represented was nation-wide in its activities and he described to me their method of working. He said that they hired competent workers, paying them a salary of 50 per cent of their regular wages, and that they would then send them to industrial plants where the organization's services were contracted for to get employment. These men would ingratiate themselves with the workers in the plant and would proceed to spy upon them and furnish reports to their superior officers. In addition to their "observation" work other employees would do propaganda work for the management in ways that seemed most advisable, either by appealing to the better instincts of the workers, their sense of patriotism or loyalty, or by creating strife and jealousies among them.

I thanked the gentlemanly individual for his trouble in coming to see me, insisting that he take his report out with himself and his hat, and bade him adieu. I told the men of the occurrence and explained to them that I had not considered for a moment obtaining the services of the agency that had given me the report. I told them that I did not feel that it was any of my business what they wished to do or say in their meetings, that if they felt they had a grievance I would much rather they discuss it in any way they chose and take what steps they thought were necessary to correct the grievance. I told them, however, that I thought they could accomplish a good deal more for themselves by taking me into their confidence, but made them clearly understand that I felt I had no right in interfering with their methods of discussion.

The Simplest Idea Must Be Sold

As Mr. Tipper points out in his article, it is not sufficient to formulate an ideal proposition and then to advance it to the people who will benefit by it.

The very best selling point that a proposition coming from the management to the workers can have is that of simplicity. Mr. Tipper speaks truly when he says that the company lawyers are prone to use the characteristic methods of legal departments and the language of the lawyer. He also says truly that the lawyer's method of approach to the question does not lead to that simplicity and clarity which is absolutely necessary in a case of this kind, if the value of the method is not to be befogged by the verbiage that surrounds its constitution.

I found the application of the simple laws of government that were brought forth by the necessity of the time wholly successful from every point of view. It satisfied the owners, the management and the workers of the little organization of three hundred souls where it was applied, and I believe that without this factor of simplicity little results will be achieved in bigger organizations and it will no doubt be demonstrated that those lacking simplicity will have no results that will benefit or appeal to the masses.

The editor of *AUTOMOTIVE INDUSTRIES* can do no better work than by furthering in the pages of his publication the creed of, first, correct principles to actuate the owners, managers and workers, and, second, simple methods of expounding these principles and beliefs and simple methods of putting them into practice.

Business Needs Leadership and Government Co-operation

(Continued from page 992)

was the first national legal step. Massachusetts has recently enacted a law permitting employees in corporate industries to elect directors of the corporations to provide them with a part in the management. There are cases where through co-operation manufacturers have voluntarily reduced prices. More frequently there is the spirit of co-operation developing by which concerns actually competitive are combining to deal with common problems of their industry."

There is something radically wrong with this country, stated Governor Edge of New Jersey, who claimed that we are lacking business leadership and governmental initiative.

"Our government," he stated, "is stopping, looking and listening, watching and waiting when it ought to be leading. The government should set the example by digging canals, building roads, increasing railway facilities, developing water power and otherwise demonstrating that Uncle Sam is not afraid to buy and hire at prevailing prices. Private business is bound to follow. Capital will be released. Labor will be employed. And our so-called post-war reconstruction prices will evaporate. We must remove the paralyzing hand of over-regulation, governmental prejudice and political management of business."

Governmental regulation that oversteps the requirements of healthy competition has degenerated to governmental persecution. The government has no justification for attempting to run the business of others until it can run its own business successfully.

The government must curtail the present war taxes on industry, said A. L. Shapleigh, decrying the effect of these taxes which take cash from industry, whereas the profits are usually represented only by increased inventory and accounts receivable.

"If the government," he said, "continues to demand so large a share of profits, the ability to increase working capital by addition of earnings to surplus, thus enabling expansion and greater employment of labor, is minimized."

Private Ownership of Merchant Marine Approved

Unanimous approval greeted the demand of Edward B. Burling for the sale of the merchant marine to private American owners. The American marine should include at least all of the ships now controlled by our government of more than 6000 tons dead weight. They should be sold to private companies or individuals and their cost prices should be regarded as war costs just as were the costs of the airplanes, motor trucks, and so forth, and the costs should be written off sufficiently to allow the sale of the ships to Americans on a basis which will allow them to compete abroad.

In a concrete plan for the sale of the marine, Mr. Burling outlined the following:

1—The government should sell all of the merchant marine ships.

2—Purchasers of ships should be free from government direction or regulation of routes or rates except as are now embodied in the law.

3—Re-sale to any foreign countries should be restricted for a period of years.

4—The ships should be sold as a whole fleet, but terms of sale must be liberal, and all of the steel ships over 6000 tons should be sold to Americans only. In order to insure the widest distribution and stimulate financial interest throughout the country the government should in-

vite the formation of shipping associations to represent the different maritime sections of the country, such associations comprising only American citizens or concerns of good financial standing and representing New England, New York City, Philadelphia, Baltimore, the South Atlantic ports, New Orleans, Pacific Coast, and San Francisco, and at the Puget Sound and the Great Lakes.

The budget committee of the chamber recommended the establishment of a national budget to be compiled by the Secretary of the Treasury for presentation to the President, to include the expenditures of the year, the condition of the national treasury, and the recommendations for appropriations for the following year, together with suggestions for raising the revenue needed. The committee also recommended that Congress should establish but two committees to have jurisdiction over all revenue and expenditure proposals, one for the House and one for the Senate.

A demand was made for cessation of price fixing by the Government by A. W. Douglas, who recommended a return to free operation of the law of supply and demand, stating that in his opinion this would bring about a decline in prices. Prolonged applause greeted his statement: "We have had enough of Government control of transportation with its incompetence and extravagance."

There is a lack of systematic business organization of retail distribution and a need for analysis of retail business and especially the introduction of systems of cost keeping, stated by Dr. W. F. Gephart of the Washington University School of Commerce. Another weakness is the failure of distributors to organize their business and classify their patrons.

The Government, he said, frowns upon associations and co-operation among business men and only because of the small minority of inefficient or dishonest men in the groups.

The middleman is the specialized distributor of commodities, he declared, between the producer and the consumer and, while there may be too many of them and too many inefficient ones, yet his function is a product of normal and natural industrial development and there is no need to fear that the individual proprietor in business will disappear.

The present tendency of manufacturers and retailers to continue the large per cent of profit of the past few years was decried by Harry A. Wheeler, president of the Chamber of Commerce, who stated that we must be content to share those profits with the Government if we do maintain them or to so shade our prices as to fall back to the profit level of pre-war years, on the principle of a fair return upon capital actually invested.

"Insofar as public ownership and operation by federal authority is concerned," stated Mr. Wheeler, "the country is farther away from the adoption of that principle to-day than it was a decade ago. But there is a strong tendency to increase public regulation, and it is important that this be recognized because co-operation with public authority will produce intelligent, constructive regulation, while disregard of the tendency will bring increasingly drastic control."

That we cannot look to the Allies for export trade for the next 4 or 5 years, and that we must make large investments in public and private enterprises in those countries, were points emphasized by Maurice Casenave of the French Industrial Mission, Joy Joyce Broderick of the British Embassy and Lieutenant Constanti of the Italian Mission. France,

SO far as public ownership and operation by Federal authority is concerned, the country is farther away from the adoption of that principle to-day than it was a decade ago.

—HARRY A. WHEELER, President United States Chamber of Commerce.

stated Casenave, is suffering severely from the results of the war, which for four years cost her 25 per cent of her normal tax revenue, the use of 80 per cent of her blast furnaces, 67 per cent of her coal, 90 per cent of her pig iron and 90 per cent of her textiles, because all of these were in the region invaded by the Germans. France, he stated, must first establish her domestic business and her own export business and inculcate a strong policy of thrift in her people before she can consider the import of commodities from foreign countries. The French Government owes the United States almost four billion dollars, and it cannot afford to increase that indebtedness by permitting exports from this country in unrestricted quantities. Similar declarations were made by Broderick and Lieutenant Constanti with regard to Italy and England.

"It is impossible," said Broderick, "to say how long the British restrictions will last, but my latest information is that they will be revised on the first of September. I presume it is quite clearly understood that the restrictions do not seek in any way to discriminate against the United States but apply equally to the manufacturers of all foreign countries."

There must be taxes and bond issues to meet the financial requirements of this country, stated Paul M. Warburg, pointing out that countries starting on the "all-tax theory" have been taught by experience that it was impossible for them to raise the funds required without recourse to huge loan operations, and conversely the "all-loan champions" found that it was foolhardy to try to raise great sums without increased taxation. We must look to those possessed of smaller incomes and subject to only moderate taxation to produce the funds for bond investments, he stated, if owing to drastic taxation the larger incomes cannot now be relied upon to furnish the bulk of the investment funds. The fundamental remedy for the national economic ills, he emphasized, lies in

If our foreign trade position is to be maintained and an outlet found for excess production we must be prepared to sell on credit, or in other words, invest the money due us in foreign securities or in foreign enterprise.—
R. F. LORRE, Vice-President, Guaranty Trust Co., New York.

thrift, which spells increased production and decreased consumption and resultant saving. This will bring about a healthy deflation and prices will then find their proper levels and our problems of equitable and reasonable taxation will solve themselves.

A plea for a centralized department to co-ordinate the work of the fifteen different government bureaus actively engaged in export matters was made by Stanley J. Quinn, secretary of the American Association of Exporters, who pointed out that there are bureaus in the departments of Commerce, State, Agriculture, Interior, and Treasury, the Federal Trade Commission, the War Trade Board and the Tariff Commission all interested in matters of concern to exporters, and which have no single place where they can co-ordinate the results of their efforts. England, he pointed out, with her vast experience in export trade, found it necessary to create a separate Department of Overseas Trade to co-ordinate the functions of the various government bureaus, and he pleaded we should do likewise.

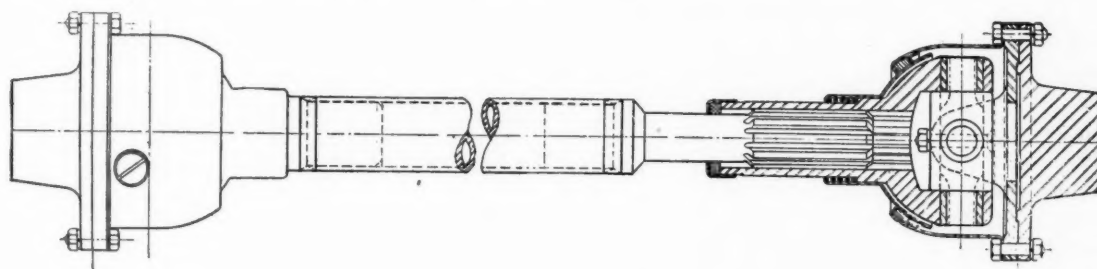
New M. & E. Universal Joints

THE Merchant & Evans Co., Philadelphia, Pa., has brought out a new line of universal joints in four sizes, rated at 25, 30, 40 and 60 hp. respectively, at 1000 r.p.m. The joint is of the yoke and block type, comprising one yoke and one disc with two lugs, which are connected by the block. The working parts consist of two hardened pins, accurately ground, the ends of which are inserted in four hardened and ground bushings, which are driven into the yoke and the lugs on the disc, both of which parts are steel drop forgings. The block is inserted between the yokes for the purpose of centering and supporting the pins.

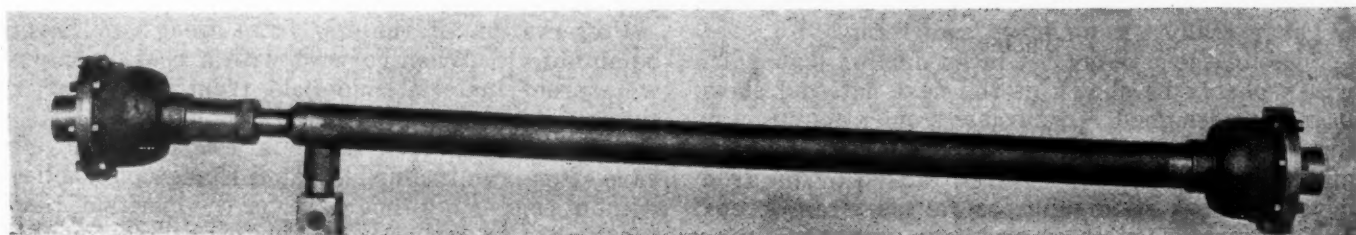
The most interesting feature of the joint is the housing. This consists of two steel pressings with spherical surfaces.

The outer part of the housing is secured to the disc of the universal by the same bolts which hold this disc to the machine part to which the universal is connected. The inner part of the housing is provided with a sleeve or hub, surrounding a coiled spring on the hub of the yoke member of the universal and having its outer edge flanged inward. This part of the housing is pressed against the outer part by means of the coiled spring. Between the inner and outer portions of the housing there is a gasket insuring a dust- and grease-proof joint.

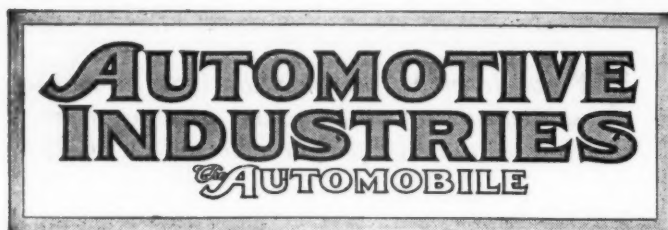
The Merchant & Evans Co. makes up complete universal sets, comprising two propeller shafts, two universal joints and a slip joint.



Section of M. & E. universal showing yoke and block construction



The M. & E. universals are made in four sizes from 30 to 60 hp. capacity



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Designing for Manufacture

ARE we going too far in the matter of designing for production?

This is something to guard against, as we cannot afford, for the sake of saving in manufacturing costs, to have performance ability decrease. Yet if it is possible to get equal performance and to really design for manufacture so as materially to reduce the number of operations per car, or to reduce the number of tools required and the number of jigs, by making parts do the work which formerly required two or three different kinds of parts, then we have really accomplished something.

Some of the cars not yet in production, but which will probably be shown at the next national show, have been designed very largely from a manufacturing standpoint. The result is that sizes of parts and sizes of tapped holes will be far out of line from a requirement standpoint, as far as stresses, etc., are concerned; yet these sizes are employed simply because they largely cut down the number of tools

and the amount of equipment required in the factory. Probably they also cut down the number of operations required, and therefore effect a gain from a manufacturing standpoint. It will be interesting to note the performance of such cars and see if it has been notably sacrificed.

A certain car which will make its appearance about the time of the next national shows is said to have no lefts and rights. Every part which will fit on the left-hand side will also fit on the right-hand side, even to the runningboards. The number of reamer sizes in the tool equipment for manufacturing this car is said to have been cut down by 50 per cent, and the number of other tools has been reduced correspondingly. This means a reduction in labor cost per car, and the money thus saved can be put into materials or it can be taken off the selling price.

Big savings in the cost of labor or in the finished product will result in a lower price and better product to the consumer. With fewer operations, the operations can be more carefully checked, and probably better workmanship will result. This is an important phase in manufacturing and should be closely watched.

The Disappearing Top

PASSENGER car bodies with a compartment containing the top when down are no novelty, though previous to the war this construction was not very general in Europe. This practice in body design now seems to have "caught on," and several of the most recent foreign cars of which details have reached this country embody this feature. We have in mind particularly the Austin 20, recently described, and a Mercedes with body by Forrier of Strasbourg.

It is rather difficult to believe that this construction will ever come into general use here. What need is there for stowing the top away in this manner, anyhow? To some people the folded top with its cover extending to the rear of the car may appear obtrusive, but we do not believe that the average person sees anything objectionable in it. It may be possible to design an attractive-looking body with a top compartment, but those that we have seen so far certainly do not possess this attribute. Not only are the bodies with top compartment less attractive than conventional up-to-date designs, but the tops designed to go into these compartments are very ungainly when up.

Possibly the inclosed top is an outgrowth of the plan to streamline the whole body. If so, it seems this idea has been carried to excess.

Preservation of the top from wear can hardly be an object. When covered with a boot or case of waterproof material and held from rattling by a suitable holder the top is well protected.

Our manufacturers in their search for novelty have often been inclined to adopt European practices without convincing themselves of the merits of these practices. In the case of the top compartment it will be well to observe great caution.

Direct Selling in Foreign Lands

THE consensus of opinion among more than 500 American business men who participated in the sessions of the foreign trade convention was that direct selling in foreign lands is the only course to permanent foreign trade.

By direct selling they meant selling through branches in foreign countries, or directly through foreign jobbers, or dealers, or exclusive foreign agents.

In any or all of these three methods of direct selling there is the one underlying fundamental, namely, that you are doing business direct with the man who is meeting the consumer in the foreign country. This is the essential, the one necessary, it might be said the imperative part, of the transactions between manufacturer and consumer in successful foreign trade.

The branch-house method was conceded to be the best one although very expensive at first. The branch manager should be an American citizen, and preferably one who has been with the home company for many years, who is a living embodiment of the spirit of the company and who knows intimately the organization in every detail. Such a manager, with a staff picked in the foreign country in which he is doing business, will be qualified to handle foreign trade as it must be handled to make it permanent.

Where the exclusive agent is used as a representative abroad he must be an agent who is a recognized factor in the line he represents. The exclusive agent of an American tire company in London must be a recognized tire man in Great Britain. That is the first requirement. After this, it is imperative that the American maker give much assistance in getting the agent started in business with his line. This is best done by one or perhaps two representatives of the manufacturing company going to London and remaining several months until the business is well launched.

These representatives see that the exclusive agent gets started right—that he knows the fundamentals of the manufacturer's business policy; that he knows every detail of the merchandise; that he knows the spirit and rule of the company's service system; that he knows the future plans of the company. Such a selling connection, established in this way, is next best to a branch.

In direct selling the personal as well as business characteristics of the several countries must be studied individually. A blanket policy of studying European characteristics will not assure good foreign trade in a single European country. The business fabric of each country must be intimately understood. So must the social structure. This is specially true in the older world and also in Spanish speaking countries where a well-established acquaintanceship is a prerequisite for business.

In some countries a certain portion of business can be designated as clean business and another portion as tainted business. The manufacturer

must understand this. By direct selling methods there is a possibility of some control over the taking of tainted business, whereas with what might be known as indirect selling there is not a possibility of the manufacturer protecting himself by any form of control in taking any of this kind of business.

By direct selling some control of the advertising of a product in foreign countries can be had. In fact the manufacturer should co-operate with the foreign seller of his product in this particular, and must realize that just as he gives his home distributors and retailers assistance by his national advertising campaigns so he must give his like assistance to his exclusive agents or jobbers in foreign trade.

This advertising must be intelligently done and not blindly dictated from the home office. There are too many cases where the home advertising company insisted on writing the copy for foreign consumer sales, which proved a dismal failure because the local conditions of the foreign country were not understood. The home advertising organization can give assistance. It can furnish copy that breathes the spirit of the home merchandising policy, but there should be no arbitrary instructions merely to translate the copy and use it. The only instructions should be to use the spirit of the copy and express it so that it will be understood in the local field.

No advertising man can write selling copy for a people living 3000 or 6000 miles away, whose country he has never visited, whose social customs he has not studied at first hand, whose business methods he has only read of and whose language he has never spoken.

Service requirements constitute one of the strongest reasons for direct selling connections. Good service is impossible where the manufacturer is not known to the consumer, as too often happens with indirect selling methods. Service in the foreign field is immeasurably more important than in the domestic market.

The carrying of an adequate stock of spares in foreign countries is a most important factor in continuing and developing foreign trade. The branch house provides the best opportunity to do so, but with the foreign jobber and the exclusive agent good representation in this particular is possible, but with a greater degree of effort. The branch house managed by a factory representative is as closely in touch with the foreign consumer as the home factory. The stock of spares in the foreign branch can be handled as methodically as the factory maintenance department. When free service has to be given the factory man is there to look into the merits of the case. And this also applies to the replacement of defective parts.

In direct selling the error must not be made of placing the business in one country under a jobber or agent in some other country. Some form of direct representation should be established in every country where it is expected to do business.

□ Latest News of the

Foreign Propaganda for N.A.C.C.

Chamber to Send Investigators Abroad and Advertise American Cars—Propose National Truck Shows

DETROIT, May 6—Active steps in spreading trade propaganda of the American motor car in foreign countries, and a move toward the holding of national truck shows in New York and Chicago, were taken at the meeting of the directors and truck committee of the National Automobile Chamber of Commerce here to-day.

The N. A. C. C. plans to send special investigators abroad immediately for the purpose of investigating the foreign markets, and an extensive world-wide advertising campaign will be carried on to exploit the merits of the American-made car and truck.

The automobile industry in 1916 exported products in excess of \$120,000,000 and the N. A. C. C. is not only anxious to maintain this business but to enlarge it. Growth is sure to come through the recognition of the value of automotive transportation due to the extended use of the American motor truck and passenger car during the war.

It is expected by this means to increase materially the export ratio to the total business. At the present time it is about 10 per cent. Details on these matters will be threshed out in New York on June 6 at a meeting of the export managers, when C. C. Hanch of the N. A. C. C. will have returned from Europe.

The truck division has taken under advisement the holding of truck and tractor shows the same weeks as the national automobile shows. Plans for the national truck shows to be held in New York and Chicago in January were outlined by the Show Committee.

The special committee on truck standardization headed by D. C. Fenner, and working in co-operation with the Society of Automotive Engineers, made substantial advances in its plans for new standard load ratings and various other matters concerning truck construction, to the advantage of users by reducing manufacturing costs and lowering selling price and at the same time adding to the efficiency and carrying capacity of the vehicle itself.

While truck business was slow in January and February, reports read at the meeting show that March and April business was reaching normal with excellent future prospects. Indications point to a great increase in truck sales in 1919.

Reports on legislation throughout the country show a marked degree of fairness on the part of state legislation for trucks. State bodies are becoming convinced of the necessity of hard-surfaced roads for their use and for motor travel in general. This is evinced in the fair attitude by lawmakers as to registration fees and weights permitted on the road. The general impression is to favor 25 cents per horsepower and 25 cents per 100 lb. as proper legislation, with 28,000 lb. as a maximum and not more than 800 lb. of weight permitted for each inch width of tire.

In attendance at Tuesday's meeting were J. Walter Drake (Hupmobile), chairman; W. D. Sullivan (G. M. C.); C. W. Williams (Hudson); J. J. Rathbun (White); H. M. Robins (Dodge); J. D. Dort (Dort), and number of export managers from Detroit plants.

Will Not Lift French Embargo

WASHINGTON, May 6—There is no truth in the reports that French import restrictions are to be completely lifted on June 1. A cablegram received by the Department of Commerce is to the effect that there may be some slight relaxation at that time, but there is no contemplated rescinding in a body of existing restrictions. Rumors were to the effect that the demand for textiles and automobiles in France would force the government to remove the import embargo.

International Harvester Buys P. & O. Plow

CHICAGO, May 7—The International Harvester Co. has purchased the Parlin & Orendorff Co., Canton, Ill., maker of P. & O. plows. The International company takes over the Parlin & Orendorff Co., with its ten branches, on July 1.

According to the financial report of the International Harvester Co. for the year ended Dec. 31, 1918, which includes operations of the International Harvester Co. of New Jersey and the International Harvester Corp., from Jan. 1, 1918, to Sept. 19, 1918, when the two companies were merged into the present organization, the combined surplus in 1917 amounted to \$12,659,000. The 1918 surplus of \$14,985,325 is \$2,326,000 in advance.

In 1918 the company charged off \$10,478,000 as depreciation of its assets in Russia. With the \$13,727,000 charged off in 1917, the deduction for the 2 years amounts to \$24,205,000. The gross income, after providing for taxes, is \$31,648,850 and the surplus account, which was \$61,051,337 in 1917, was increased at the end of 1918 to \$68,036,662.

Vacuum Tank Patents Not Infringed

Previous Decision Freeing Weinberg of Stewart-Warner Infringement Claim Upheld

CHICAGO, April 7—The patent situation on vacuum tank methods of fuel feed made another step toward final solution when the Court of Appeals, April 30, upheld the previous decision of the United States District Court that the Thermo-Vacuum system based on Fred Weinberg's patents does not infringe the Webb-Jay patent on which the Stewart-Warner tank is built.

While directly affecting only the situation as between Stewart-Warner and the Thermo system, it also indirectly may influence the final decision on the appeal of Stewart-Warner from the decision of Judge Westenhaver last winter, which held that the Sparton tank, manufactured by the Sparks-Withington Co., infringes the Stewart-Warner patents only on two points of a series claimed.

After Judge Sanborn handed down his decision, April 20, 1918, in the United States District Court, holding that the Thermo-Vacuum system brought out by Fred Weinberg of Detroit was not an infringement on the Webb-Jay patents under which Stewart-Warner is licensed to manufacture the Stewart-Warner vacuum tank, Stewart-Warner appealed the case in the district Court of Appeals, and April 30, 1919, in this court, Judge Baker affirmed the decision of Judge Sanborn.

This court held that pumping a liquid, either gasoline or water, was an old process, and that while the Stewart-Warner patents were valid, the Weinberg tank was not an infringement, as in both devices the whole apparatus combined with the engine was broadly a pump.

On Dec. 10, 1918, the Webb-Jay patents on the Stewart-Warner vacuum tank were held infringed by the Sparton vacuum system, made by the Sparks-Withington Co. In a decision handed down by Judge Westenhaver, in the United States District Court, also in Chicago, again the Stewart-Warner patents were held valid. Two of the 14 or 15 claims of Stewart-Warner were held infringed. The other claims for which an infringement decision was asked were upheld in a decision that the Sparton tank did not infringe.

This has been carried to the Court of Appeals by Stewart-Warner, and should this court be influenced by the recent decision of Judge Baker in affirming Judge Sanborn's decision on the Weinberg patents, and rule that the Sparton tank was

Automotive Industries □

not an infringement on the Jay patents, then Stewart-Warner may carry both cases to the Supreme Court. If the decision of Judge Westenhaver is affirmed, then Stewart-Warner will probably not carry the Weinberg case to the Supreme Court, as they feel the Thermo-Vacuum system is not a real competitor.

Air Service Establishes Landing Fields

WASHINGTON, May 6—The Air Service of the U. S. Army has inaugurated a plan to establish landing fields in all parts of the United States in co-operation with municipalities, according to announcement by Maj. Gen. C. T. Menoher, and has issued specifications which are in accord with the army regulations. Together with this announcement, the Air Service states that it has already designated 32 cities and towns from the Atlantic to the Pacific where it hopes to secure the aid of the municipalities to establish and organize a national system of air lanes. Landing fields will be of four classes.

The Air Service will select landing fields in co-operation with municipal representatives. Neither the Air Service nor the Post Office Department will deal with any private associations in this matter.

At present the government will co-operate only in the establishment of municipal flying fields at the cities where the Post Office Department establishes aerial mail stations, or where the Air Service cross country routes require intermediate stations. The following cities have already been designated and flying fields will be built at each:

Boston, Mass.	Columbus, Ohio
New York City, N. Y.	Tucson, Ariz.
Richmond, Va.	Phoenix, Ariz.
Raleigh, N. C.	Yuma, Ariz.
Columbia, S. C.	Bakersfield, Cal.
Augusta, Ga.	Fresno, Cal.
Macon, Ga.	Buffalo, N. Y.
Atlanta, Ga.	Syracuse, N. Y.
Kissimmee, Fla.	Albany, N. Y.
Mobile, Ala.	Columbus, N. M.
New Orleans, La.	Kansas City, Mo.
Baton Rouge, La.	Oklahoma City, Okla.
Beaumont, Texas	Uniontown, Pa.
Flaton, Texas	Daytona, Fla.
El Paso, Texas	Cleveland, Ohio
Texarkana, Texas	Chicago, Ill.

Although the government is confining itself to the establishment of these municipal landing fields, there is no restriction on other landing fields at cities and towns where local conditions or local initiative warrant it. The government will furnish an expeditionary steel hangar to be erected at the expense of the municipality.

It is understood also that the landing fields will be prepared at the expense of the municipality, which will also bear the expense incurred in the procurement of personnel and the maintenance of the field and equipment exclusive of air-planes.

Treasury Department Issues Rulings on Excise Taxes

Official Interpretations of the Law as It Applies to Automotive Products—Regulations Covering the Manner of Calculating the Amount of Tax and How It Is to Be Collected—What Is and Is Not Taxable

HIGH LIGHTS IN THE TAX REGULATIONS

TAX became effective Feb. 25, 1919.

The tax is on the actual sale.

If the tax is included in the sale price, the tax must be computed on the increased price.

Discounts for cash made subsequent to the sale cannot be deducted. When a rebate is made in return for a quantity purchase that extends over a period of time a deduction of the rebate is allowed to be made for the month when the final price is determined.

Commissions to agents or other expenses of sale are not deductible.

A maker of a body pays a tax. A maker of a chassis pays a tax. The assembler of both pays a tax, but can credit himself with the amount of the tax imposed on the body and chassis makers.

Where makers have agencies in which they have financial interest the agency pays the tax.

Tractors are not taxable even if sold in combination with trailers.

Trailers are not taxable unless they are of the type that forms the rear part of a car or truck.

When parts are sold by a maker to a jobber and in turn to a producer of cars, the manufacturer of the parts pays the tax.

Where a maker of parts or accessories sells them to a maker of cars, trucks or motorcycles, the manufacturer of the completed article pays the only tax.

If a manufacturer is engaged in both wholesale and retail business he bases the tax on the wholesale prices when sold at wholesale and on the average wholesale price of the articles sold at retail.

There is no tax for cars, trucks or motorcycles sold for export, provided they are exported within six months of the date of sale.

WASHINGTON, May 6—Regulations and interpretations of the income taxes as they apply to automotive products have been completed by the Treasury Department.

The rulings are not sufficiently complete to allow definite understanding of all of the problems that have come up in relation to the tax on automotive products.

In some instances they are exceedingly vague, as, for example, in the statement that if any doubt exists as to whether an accessory should be taxed, it will be determined by the fact that it is sold to an automobile accessories dealer by the manufacturer, which ruling is completely reversed by a following statement to the effect that a monkey wrench sold for general purposes is not subject to a tax.

On all such matters it will be necessary to secure definite special rulings from the Treasury Department. This, judging from the length of time taken to compile the present regulations, will

occupy some few months, and in the meantime it will be necessary for the manufacturers to pay the tax and depend on a later ruling for securing credit where credit is due from the government.

That a tax can be imposed more than once on the same commodity is shown in the case of the assembler of automobiles who buys chassis from one maker and bodies from another. Each of the three producers has to pay a tax although certain credits are allowed the assembler as specified below.

Where an automobile maker has an agency in which he has a financial interest he does not pay a tax on the cars delivered to that agency for sale until the agency makes the sale. The agency then pays the tax. This is apparently done because of the difficulties that would arise if a manufacturer shipped a number of passenger cars to one of his branch retail establishments and had to pay a tax on them, whereas they have

(Continued on page 1031)

Rapid Increase in Car Production

7084 Cars a Day Turned Out in Michigan and Ohio During April—Demand Well Ahead of Output

Daily car production figures for April are as follows:

Car	Jan.	Feb.	March	April
Buick	100	400	450	500
Briscoe	30	50	50	75
Barley .....	...	4	10	12
Cadillac	55	60	80	100
Chalmers	30	65	70	80
Chandler .....	...	50	90	60
Chevrolet .....	...	300	350	700
Columbia	8	10	15	18
Dodge	300	375	400	500
Dort	40	65	70	100
Ford	1,300	2,000	2,400	3,000
Harroun	4	4	10	15
Hudson	30	50	50	100
Hupp	38	55	65	75
King .....	...	4	10	10
Liberty	15	15	25	30
Maxwell	150	150	220	250
Oakland	160	160	200	...
Olympian	4	5	10	12
Oldsmobile .....	...	110	140	140
Overland	320	400	422	600
Packard .....	...	...	1	25
Paige	50	50	55	70
Paterson	10	10	10	15
Jordan	104	...	...	12
Reo	104	100	125	125
Saxon	10	50	65	50
Scripps-Booth	20	40	45	45
Studebaker	150	150	175	200
Essex	30	50	50	100
Grant	25	35	50	50
Total	2,984	4,822	5,741	7,084

DETROIT, May 3—Production figures for Michigan and Ohio show that approximately 7084 automobiles were made daily during April. This is an increase of 1353 cars over the daily March production of 5741 cars and nearly 2½ times greater than the production of January, when 2984 machines were turned out daily.

From the unprecedented sales orders in the hands of manufacturers it is evident that if every factory could double its production every car would have an immediate sale. The demand for cars is greater to-day than at any other time in the history of the automotive industry. The demand exceeds the production of practically every company from 33½ to 76 per cent.

If the majority of the plants increase production during May, as many are now endeavoring, daily production for the present month will average approximately 10,000 cars and the month of June will see it reach a high mark under present manufacturing conditions. So great is the demand that many plants are rushing work on new building units. This is noticeably true of the Jordan Motor Car Co., Cleveland, which proposes to build a new plant greater than its present establishment. The Hudson Motor Car Co. is pushing work to the limit on new units to handle Essex production. Scripps-Booth will have a new factory this fall. General Motors expansion plans call for greatly increasing the manufacturing facilities of Buick, Oakland, Oldsmobile, Cadillac, Chevrolet and its other passenger car units.

Production during April was boosted despite the handicap of a tight material market and labor difficulties. All parts makers are experiencing an equally great rush of business and are unable to keep up with orders. As a result the companies depending upon them for parts are obliged to limit production to their parts supply. The parts makers have not switched from a war to a peace basis with the same rapidity of the motor car companies, and as a result are just beginning to reach capacity production. They have been harder hit by the hold-up of funds on government contracts, but this disadvantage has lately been overcome by the willingness of the government to advance 70 per cent of the money they claim is due them, leaving the remaining 30 per cent to be paid when the contract claim is finally approved at Washington.

The Detroit car manufacturers have encountered considerable difficulty in obtaining a steady flow of castings from the foundries, due to labor trouble. During April, 13 Detroit foundries were tied up by strikes. Seven are still affected, but six of the strikes have been settled. The companies all have had trouble in various departments, but in almost every instance the workers returned to work in the course of a few hours. However, suspension of operations for but a brief period had a marked effect on production, causing the April output of a number of concerns to fall short of schedule.

Packard Running Up Production

DETROIT, May 2—The Packard Motor Car Co. is running up its production rapidly, producing 200 passenger cars and 750 trucks in April. In May 350 passenger cars will be turned out, while June and July production calls for 500 cars monthly.

Paterson Turning Out 15 Machines a Day

FLINT, May 2—The Paterson Motor Car Co. is running 15 machines daily and is preparing to increase this production. The company has encountered some difficulty in securing material, but this situation has been greatly relieved within the last three weeks.

Harroun Picking Up on Production

DETROIT, May 2 — The Harroun Motors Corp. of Wayne, Mich., is now running 15 cars daily. Within the next 30 days the company hopes to produce 25 cars per day.

The assembly department of this plant is still choked with government machinery, which has not yet been removed. Until this machinery is taken out production will be greatly curtailed.

Chandler to Make 3000 in June

CLEVELAND, May 2—The Chandler Motor Car Co. hopes to produce 2500 machines this month and 3000 in June. At present it is running approximately 16 cars daily.

Detroit Now Faces Labor Shortage

50,000 Skilled and Unskilled Workers Needed—Active Efforts to Enlist Men in Other Centers

DETROIT, May 2—There is a shortage of 50,000 skilled and unskilled workers in Detroit and an advertising campaign is being conducted in 69 cities where a surplus is reported. The larger companies are going even further, and are sending field representatives into these localities to head the unemployed toward Detroit. An example is the Packard Motor Car Co., which could use 500 more men immediately. This company has sent men to Camp Custer and to Great Lakes Naval station offering immediate employment to all service men the minute they are released from service.

Every company has more business than it can handle and the cry for men is becoming greater daily. As a result wages are beginning to go up, and it is predicted that within a month the scale will be greatly increased everywhere. The great obstacle which the companies must solve is the housing situation. This is daily becoming more critical. Rents are soaring and homes are at a premium. The companies are meeting this situation manfully and are not only contemplating house construction for employees but are aiding in the financing of a \$5,000,000 corporation which proposes to start work at once on several thousand homes.

Within three months Detroit's labor problem has swung from one extreme to the other. In February between 30,000 and 50,000 men were without jobs, and the word was sent out to stop the flow of labor to Detroit. This warning had a noticeable effect, with the result that Detroit has a huge shortage.

The first of May saw labor demonstrations of a minor nature in Detroit. There are many strikes on and a universal cry for more wages. The big automotive concerns are not greatly affected, however. Some of them have suffered small walk-outs, but the trouble is usually settled in a few hours and the men are back on the job. While wages have advanced generally in the last three months, the advance is not keeping pace with the increasing cost of living, which still continues to soar. The increase in the wholesale cost of all commodities between August 1, 1914, and April 1, 1919, is 72 per cent.

Apperson Adopts 25 Per Cent Profit Sharing

KOKOMO, IND., May 6—Twenty-five per cent of the profits of the Apperson Brothers Automobile Co. for 1919 will be distributed among its employees who have been with the company throughout the year, proportionate to the amounts paid to each during the year. Announcement of the plan was made this week by the company to all employees.

The distribution of the employees' share in the profits will be made at the same time that dividends are determined for the stockholders, and the amount will be one-quarter of the net profits, after deducting the 8 per cent allowed by the Federal Income Tax law on invested capital. Every employee of the company, in whatever capacity, will share in the distribution provided he has been with the company throughout the year, and still in its employ at the time of the profit distribution.

Shop Committee to Represent Overland Employees

TOLEDO, May 5—Details of a plan whereby Toledo employees of the Willys-Overland Co. will elect a shop committee to represent them in all negotiations with the company will be announced soon. In a preliminary statement the company explains that a committeeman will be elected by secret ballot from the various departments, and that these committeemen will form a joint committee with representatives of the management.

When the plan is in operation the workers will have a direct voice in determining working conditions, questions of safety, health, discipline and unfair treatment, and in settling any differences that may come up between them and the company. A general board of adjustment also will be organized, composed of both representatives of the employees and the company, to which cases may be appealed. Every employee, male or female, in service 3 months may vote for his choice of representative.

Wilson Foundry Makes Bonus Awards

PONTIAC, May 3—The Wilson Foundry & Machine Co. has announced a plan of continuous service awards for working men. The amount of these bonus distributions aggregates \$250,000 a year. The plan is based on efficiency and continuity of service.

Every employee working 6 months without absence except for recognized reasons will be entitled to participate in the payments made quarterly. The first checks were distributed to-day in addition to the quarterly payments, and the annual one will be made rewarding long continued service and efficiency.

White Capital Raised to \$20,000,000

CLEVELAND, May 5—An increase in the capital of the White Motor Co. from \$16,000,000 to \$20,000,000 was voted at the annual meeting of the company's stockholders. Its regular quarterly dividend of \$1 per share was declared, payable June 30 to stockholders of record June 14. All directors and officers were re-elected.

Maxwell Sales Ahead of Production

DETROIT, May 5—The Maxwell Motor Car Corp. is running between 200 and 250 cars daily. Sales are exceeding production of this company by 33 1/3 per cent.

Detroit Labor Trouble Continues

26 Unions Filed Demands on May 1—Several Strikes Indirectly Attack Ford Company

DETROIT, May 5—Labor trouble in Detroit continues to grow in scope. On May 1, as predicted last week by AUTOMOTIVE INDUSTRIES, 26 unions filed demands for more wages and shorter hours.

The outlaw United Automobile, Aircraft & Vehicle Workers of America called strikes in several plants. Altogether, approximately 12,000 workers of different unions went on strike at the plants of Wilson Body Co., Liberty Starter Co., Detroit Brass Works, Murphy Iron Works, L. A. Young Industries Co., Bowen Products Corp., Aluminum Castings Co., Commonwealth Brass Co., Solvay Process Co. The men returned to work when general wage demands were met by the respective companies. Strikes in 7 out of 13 foundries still continue. No settlement has yet been reached in the Wadsworth Mfg. Co. strike.

A number of strikes were averted by compromise agreements. The Electrical Workers, who threatened a general walk-out, postponed action until May 17 at the request of the strike committee, who said a settlement would probably be reached by that time. The Typographical Union settled with the employers on a \$36 weekly scale with 48 working hours a week. This union asked for \$42 salary and 42 hrs. a week.

While the United Automobile, Aircraft & Vehicle Workers of America are strongly organized in Detroit, attempts of this organization to form a local branch in Flint, home of Buick, Chevrolet, Dort and Paterson automobile companies and scores of other automotive concerns, last week met with a rebuff. The Flint Federation of Labor has gone on record as bitterly opposed to this new organization, branding it as a "pirate organization not affiliated with the American Federation of Labor, radically socialistic in its demands and a sister of the I. W. W." The Flint unions are preparing to wage a bitter fight against the entry of the outlaw organization in that city.

In Detroit it is apparent that labor's indirect attack is at the Ford Motor Co. The walkout in the Liberty Starter Co.'s plant, practically halting all work, has all but cut the Ford company out of starting devices for its sedans and coupés. The Liberty company is devoted exclusively to the manufacture of starters for Ford cars. The Wadsworth Mfg. Co. is working entirely upon Ford sedan and coupé bodies. Its production has dwindled from 250 bodies daily to less than that number in three weeks. The Wilson Body Co. is also making Ford bodies in large numbers and its production has been badly hampered.

At the Liberty Starter plant the machinists have gone out. The union asks the reinstatement of certain employees

discharged for labor activities, the elimination of the check system of wage payment, the elimination of "gum-shoe" men, service men to be restricted to exits, adjustment of conditions in some departments by officials meeting with the department committee, a minimum wage of \$6 per 8-hr. day for men and women alike, a 42-hr. working week, time and one-half for overtime up to four hours, double time for a longer period; double time for holidays and Sundays, 80 cents per hour for tool specialists, 90 cents per hour for tool makers.

At the present time strikes have not affected the automobile companies directly, being confined entirely to parts and body makers. Some of the automobile plants have had a little trouble in some departments, but it was only temporary and production was not materially affected.

Wages Increase 32.5 Per Cent in February

WASHINGTON, May 5—Wages in 47 automobile factories increased 32.5 per cent for the month of February, 1919, as compared with February, 1918, while the number employed increased only 0.8 per cent. Forty-seven manufacturers reporting stated that they employed 109,583 workers in February, 1918, for \$2,445,176, as compared with 110,472 in February, 1919, for \$3,240,057. The increase of February as against January, 1919, although not so high, is marked. Forty-six manufacturers reporting for February stated an employment of 108,546 against 107,741 in 1919, an increase of 0.7 per cent, while the pay roll for February, 1919, totaled \$3,197,307 as against \$2,963,982 for January, 1919, an increase of 7.9 per cent.

Company Formed to Meet Akron Housing Scarcity

AKRON, May 5—Akron has launched a campaign to raise two and one-half million dollars for the purpose of building homes for the working men. The housing problem has been very serious here since early spring, when the factories expanded their activities and greatly increased their working forces. This project is being fathered by the housing committee of the Chamber of Commerce and has been endorsed by the heads of all of the city's industrial plants.

The company to be formed will work along three lines; it will let money on first and second mortgages at reasonable interest to men who want to build, supplementing the home financing done by banks and savings and loan companies in this respect.

The company will build houses to rent. It will encourage renters, however, to buy. Rentals charged will be high enough only to carry the investment and overhead expense. The effect of a lot of such houses for rent will, it is thought, bring down the exorbitant rents now charged in many sections.

While the company will be legally a corporation for profit, it does not expect to make more than 6 per cent, and the stockholders may have to content themselves with 5 or 4 per cent.

The company, which is as yet unnamed, will have an authorized capitalization of \$5,000,000, but only half of this amount will be issued at this time. The Goodyear, Goodrich and Firestone Tire companies have already subscribed for half a million apiece, so there will be just a million dollars' worth of stock to be floated in the city generally. A campaign will be put on to raise this money.

General Motors to Become Billion Dollar Corporation

NEW YORK, May 5—General Motors will likely become a billion dollar corporation. At the meeting of the board of directors in Wilmington last week, President W. C. Durant stated that the board of directors had recommended an increase in the debenture stock to \$500,000,000 and in the common stock to \$500,000. The increase will be passed upon at a special meeting to be held on June 12.

W. P. Chrysler is elected first vice-president and H. H. Bassett was added to the Board of Directors and appointed general manager of the Buick division. Both Bassett and F. W. Hohensee, general manager of production of the Chevrolet division, were elected vice-presidents. The complete list of officers and directors follows: President, W. C. Durant; first vice-president, W. P. Chrysler; vice-presidents, H. H. Bassett, A. G. Bishop, R. H. Collins, W. L. Day, J. A. Haskell, A. W. Higgins, F. W. Hohensee, R. S. McLoughlin, C. S. Mott, J. J. Raskob, A. P. Sloan, Jr., Edward VerLinden, F. W. Warner; secretary, T. S. Merrill; treasurer, H. H. Rice; comptroller, M. L. Prensky.

Oakland Adopts 48-Hour Week

PONTIAC, MICH., May 5—The Oakland Motor Car Co., beginning May 8, will put its entire plant on a 48-hr. a week basis. The plan calls for beginning at 7 a. m., a 50 minute noon hour, and closing at 4.30 p. m. The usual half-holiday Saturday is allowed. To keep wages near the old standard certain increases in piece rates and hourly rates have been allowed.

Jordan Capital Jumps Over Million

CLEVELAND, May 6—The capital stock of the Jordan Motor Car Co. is to be increased to \$1,200,000, 7 per cent preferred, and 12,000 shares of common with no par value, authorization for the increase having been voted at a special meeting yesterday. The company will erect several new buildings and will make a conservative increase in production.

Last year Jordan business totalled \$8,000,000 on a capital of \$300,000. The new stock issue will be in the form of a 50 per cent stock dividend. Edward S. Jordan retains control of the company.

6000 Machinists Quit at Overland

Demand 44-Hr. Week, Wage Increases and Elimination of All Piece Work

TOLEDO, May 6—The International Machinists Union called a strike at the Willys-Overland Co. plant at 3.30 Monday afternoon. Approximately 6000 machinists quit at that hour, refusing to work until 4.06 o'clock, the closing hour decided upon by the company. There are 6665 men at work in the plant to-day. The strikers have picketed the factory, and have declared they will resist to the utmost the effort to put a 48-hour working week into effect. There has been no rioting. Automobile production has been considerably curtailed. Production in some departments is at a standstill. Just how much the daily output has been hit will not be known for several days.

C. A. Earl, vice-president and general manager of the Willys-Overland Co., said to-day:

We are going to stand by the interests of the great mass of our employees. We are not going to let the radicals run this business. We have been trying for 6 weeks to reach an agreement with the Union. Every attempt has failed. This matter had to come to a head sooner or later and it is probably just as well that it be settled now as later. We are going ahead at any cost.

The Willys-Overland company to-day stands with absolutely clean hands and a clear conscience in its dealings with its employees. In its desire to promote harmonious relations with its workers, it has established a 50-50 profit sharing plan through which the first payment of the company distributed \$415,000. The company has made a wage adjustment by which thousands of its employees received increases. The company has provided for an employees' representation plan by which every employee can present any grievance as to hours, wages or working conditions, with absolute certainty that a fair adjustment will be made. This company has asked its employees to work 48 hours a week, to co-operate with it in competing with others in the automobile industry, where hours range from 48 to 55 a week. The Willys-Overland presents this open record of its policy to demonstrate conclusively that fairness and justice have been the paramount considerations in all its dealing with its employees.

On March 27, the Willys-Overland Co. was presented with written demands by a committee of employees claiming to represent all the employees, when as a matter of fact many departments were not included. These demands, among other things, called for increases in pay of from 15 to 50 per cent for a 44-hr. week of 5 days of 8 hr. each and 4 hr. on Saturday; elimination of all piece work; double time for all overtime, with other restrictions referring thereto; a closed shop with a shop committee elected from certain sections of their employees without regard to the interests of other workers, and this committee to be elected outside of the company's plant, and such a committee to be recognized by the company for the adjustment of all grievances.

Their demands further provide that all physical examinations should be discontinued, notwithstanding that this practice has proven to be in the interests of the employee and has had the unqualified indorsement of governmental boards and national labor leaders. Other restrictions were imposed as to apprentices. With these demands there was not submitted, nor has there been since at the several conferences held between the company and this committee, one line of supporting evidence substantiating the fairness of the demands made or the practice of them in the automobile industry.

Meetings have been held from time to time whenever desired by the committee. The company has offered to lay before the committee its reasons in writing in support of the position that it has taken on the several

questions at issue. The committee's answer in effect has invariably been: "It's not what the war and labor boards have done, it's not what constitutes an 8-hr. day. It's not what the other competing automobile companies are paying as wages nor the hours worked nor their piece work systems, but it's what we want or, in other words—COME ACROSS."

No weight nor attention was paid to the facts or given any consideration whatsoever that supported the position of the company. From the very outset the company officials made plain to this committee their attitude on the question of hours of work and the other conditions in question. Monday the committee refused to avail themselves of the representation plan or give it a single trial, even when they were told that the first work of this employees adjustment board could be a division of the 48-hr. week into six 8-hr. periods or the basic 8-hr. day.

It became very evident from the first that it was not the 8-hr. day that the committee desired, but a 44-hr. week. It has been made plain by the officials of the company, both through the shop paper and the public press, that the new classification of wage scale which has resulted in increases to thousands of Willys-Overland workmen, that any inequality in classifications or rates could be taken up and adjusted. They absolutely have refused to have anything to do with it.

The fact that for years in the arsenals and Navy Yards a system of grading and classification of employees has been in force with all the advantages that accrue to the workmen in a wage system of this kind received no consideration at their hands. The fact that time and a half overtime to be paid each day beyond the standard working hours did not interest them, notwithstanding many recent decisions of governmental boards recognized the practice of paying overtime only beyond the 48-hr. week. Nor did the representation plan, in which the employees are to elect half the members of the adjustment board, serve to interest them, nor to offer any indication to their minds of the company's fairness.

The company is manufacturing automobiles in a competitive field. The proposed 48-hr. week is as short as, or shorter than their competitors. Its wages are equal to or higher. The working conditions are equal to or better. The company has paid to its employees within the last few days the sum of \$415,000 from the profits on the 50-50 plan for the first quarter of 1919.

The company has made a most careful survey and investigation of rates of wages paid in this industry, has installed these rates which range from a minimum of 40 cents to \$1.10 per hr. for male employees. It has classified the workmen in an equitable and fair way and provided means of remedying, through the proposed employees' committees, any errors that might have occurred in this enormous task.

Last, but not least, they have provided a representation plan of taking up and correcting grievances and complaints, providing for a voice of their employees in all matters of wages, hours and working conditions.

With many concerns actually reducing wages and lengthening working hours, this company, in order to meet and maintain the fairest conditions in its plant, increased wages and announced a 48-hr. week for a period of at least 8 months.

The company is charged with the conduct of its business through its officials, who are responsible to the stockholders of the corporation, and to those loyal employees who appreciate what the company has done in this way of a profit-sharing distribution, representation plan and a wage increase.

The company proposes to stand to the end by those employees who desire to be fair and work squarely with them in partnership. It does not propose, nor can it permit, persons who are not its employees and who have no responsibility in the conduct of its business, to dictate its business methods or policy. The company appreciates the loyalty of its many thousand employees who refuse to believe the untruthful and misleading statements of outside agitators, and who are standing manfully by this company, and who have assured their foremen and department heads that they would not cease work as some did because of the threats and attacks made upon them.

The company wishes to emphasize the fact that there has been no lockout. Those who left work did so voluntarily and in defiance of the rules of the company.

Mr. Willys very much regrets that his profit-sharing plan, in the interest of his employees, should not be appreciated by some of them at the Toledo Plant, who have voluntarily forfeited additional profits that would have come to them in the next two distributions.—C. A. Earl, First Vice-President.

(Continued on page 1034)

Treasury Department Issues Rulings on Excise Taxes*(Continued from page 1027)*

not been actually sold since the manufacturer owns the retail establishment. The tax on the cars sold through the retail establishment of a manufacturer is based on the wholesale and not the retail price.

The interpretation to the effect, that trailers are not taxable except when they form a composite part of a truck is apparently meant to apply to those units which are attached to a chassis to form the truck. Likewise the interpretation allowing for credit of taxes where rebates are made on quantity sales stretched over a period of time is probably intended for such manufacturers as Ford, which rebates its dealers after they have purchased a certain quantity of cars. The regulations regarding tractors do not specify farm tractors and apparently no tractor is taxable whether it is intended for farm or other use.

Taxes are effective on all articles sold or leased by manufacturers, producers and importers beginning February 25, 1919, regardless of the date of manufacture.

In the tax law the use of the word "manufacturer" means also "producer" or "importer"; the word "sale" or "sold" includes "lease" or "leased." The term "purchaser" includes the "lessee" and the word "person" includes "partnerships," "corporations" and "associations" as well as individuals.

The tax is imposed on the sale, by the manufacturer and is measured by the price for which the automobile or article is sold.

The tax is on the actual selling price, not on the list price.

If the price of a taxable article is increased to cover the tax the tax applies on the increased price.

Discounts for cash made subsequent to the sale cannot be deducted when assuming the tax, but if the articles are sold over a period of time with an agreement for a quantity rebate this fact may be taken into consideration in calculating the tax when the rebate is made.

Commissions to salesmen or agents and other expenses of sale are not deductible from the price.

If an article is sold at the factory and the buyer pays the delivery charges from the factory f.o.b. freight cars, or if it is sold delivered at a price less delivery charges, to be paid by the purchaser, the charges need not be included in the price of the goods.

If the manufacturer sells f.o.b. consumer and himself pays the delivery charges he cannot make deductions.

If articles sold are returned and the sale entirely rescinded no tax is payable, and if paid it may be credited in a subsequent monthly return. If part of the articles sold at one time are returned and credit is allowed, the proportion of the tax to be credited will be only that proportion of the total tax paid which the amount allowed as a credit or rebate

bears to the total sales price of all of the articles.

A manufacturer is a person who prepares a taxable article in marketable form.

Under this interpretation if there are several manufacturers, as, for example, if a manufacturer produces a body and another a chassis and these two are assembled by a third, each must pay a tax. However, the assembler can credit himself with an amount equal a tax he has already paid to the manufacturer of the body and of the chassis. It is necessary, however, for the assembler to keep records to clearly establish his right to this exemption.

When a manufacturer sells passenger cars or motor trucks to the government, the tax applies unless the government has supplied the manufacturer with all but a small portion of the parts used in the assembling.

There is no tax on motor driven vehicles used in intra-factory work at railroad stations, etc., where they are used to pull other vehicles. Motor trucks equipped as hook and ladder trucks are taxable.

Automobiles sold by a manufacturer and once taxable are not taxed when sold again unless the manufacturer accepts the return of the automobile and resells it after taking credit for the tax on the first sale.

Tractors are exempt even if sold in combination with trailers.

Accessories, tires, etc., sold to a dealer for the rebuilding of a used car are taxable.

Manufacturers of accessories when selling them to assemblers or manufacturers of automobiles must secure written certificates that the accessories and parts will be used in the manufacture of new cars or for free replacement under contract or guarantee.

Failure to possess such certificates will be considered sufficient to warrant demand of payment of tax by the government.

A "part" for a motor truck, motor wagon, other automobile or motorcycle is any article designed or manufactured for the special purpose of being used as or to replace a component part of the vehicle and which by reason of some peculiar characteristic is not such a commercial commodity as would ordinarily be sold for general use and which is not primarily adapted for use as a component part of the automobile or motor truck or motorcycle; consequently bolts, nuts, screws, etc., are not taxable. Articles which would ordinarily be classed as commercial commodities become taxable when the design or construction adapts them for use as component parts of vehicles, as, for example, plates, jars and separators for automobile storage batteries are taxable when sold separately. A chassis is a part of an automobile, as is also a body, and is taxable at 5 per cent when sold separately regardless of whether it is a chassis for a passenger car or motor truck.

An accessory is any article designed primarily for use on a motor vehicle to

add to its utility and is taxable whether or not it is essential to its operation.

Robes, goggles and lunch kits are not taxable.

Automobile trailers are not parts or accessories for automobiles, but rear portions of automobile trucks that are not properly called trailers are taxable as a part of the truck.

Where a manufacturer sells automobile accessories or parts to a jobber who in turn sells them to a manufacturer of completed cars the tax is paid by the manufacturer who sells these parts or accessories to the jobber. Where a manufacturer sells raw materials to an accessories maker who in turn sells the accessories to a manufacturer of completed passenger cars, the producer of the completed vehicles pays a tax on his sales and no tax is due on the previous sales.

When a manufacturer sells a passenger car, for example, both at wholesale and retail, he pays a tax on the passenger car sold at retail computed on the same price for which he sells them at wholesale.

Taxes are returnable and payable monthly and every return must be made under oath and in duplicate if it exceeds \$10. A tax does not apply to the sale of a motor vehicle which is shipped directly to a foreign country by the manufacturer himself or sold by him for export and in proper time exported by the purchaser. If, however, an article sold for export is not exported within six months it becomes taxable. It is necessary for a manufacturer to secure a written certificate to the effect that a car or motorcycle sold is to be exported. Proof of exportation comprises an affidavit containing the name and address of the manufacturer and of the exporter, the dates of the sale and shipment and export of the car or motorcycle, the price paid and a statement that the commodity has not been subjected to further manufacture following its purchase, the name of port of export, the name of carrier issuing the export bill of lading and a copy of the export bill of lading.

Following are the complete regulations as they apply to the automotive industry:

EXCISE TAXES ON SALE BY THE MANUFACTURER

Article 1. Effective date—The tax is imposed on all articles sold or leased by the manufacturer, producer, or importer on or after Feb. 25, 1919, even though manufactured, produced, or imported before that date.

Art. 2. Use of terms—In these regulations, for convenience, unless obviously inapplicable, the term "manufacturer" is used to include also "producer" and "importer;" the term "sale" or "sold" to include "lease" or "leased;" the term "purchaser" to include "lessee," and the term "vendor" to include "lessor." The term "person" is used to include partnerships, corporations, and associations, as well as individuals.

Art. 3. Basis of tax—The tax is on the sale by the manufacturer of the taxable article. It is measured by the price for which the article is sold. It is on the actual sales price of the goods sold, and not on the list price, where that differs from the sales price. If the price of a taxable article is increased to cover the tax, the tax is on such increased price. Where, however, the tax is billed as a separate item such amount need not be included in the price of the article in computing the tax. The tax is payable in respect to a sale made, whether or not the

purchase price is actually collected. (See further Art. 6.)

Art. 4. Discounts and expenses.—A discount for cash or other discount made subsequently to the sale cannot be deducted in computing the price for the purpose of the tax. Where, however, articles are sold over a period of time under an agreement for a quantity rebate, the tax, if originally computed on the gross price, may be adjusted in the return for the month in which the price is finally determined. Commissions to agents and other expenses of sale are not deductible from the price. If articles are sold at the factory or f. o. b. cars at the place of manufacture, and the delivery charges from such place to the point of delivery are paid by the purchaser as a specific item, or if they are sold delivered at a sum less delivery charges to be paid by the purchaser, such charges need not be included as a part of the price of the goods, but if the manufacturer sells goods at a delivered price and he himself pays the delivery charges, he is not entitled to make any deduction on account of the inclusion in the price of such charges.

Art. 5. Exchanges.—If articles sold are returned and the sale entirely rescinded, no tax is payable, and if paid it may be credited against the tax included in a subsequent monthly return. See Article 41. If a part only of the articles sold at one time is returned, and credit or rebate allowed by the vendor therefor, the portion of the tax to be credited will be only the proportion of the total tax paid which the amount allowed as a credit or rebate bears to the total sales price of all the articles. If an article is sold under a guarantee as to its quality or service and is thereafter returned and a rebate made pursuant to the guarantee, the vendor may claim as a credit against the tax included in a subsequent return such portion of the tax originally paid in respect of the article as is proportionate to the amount of the price refunded. If an article is sold and thereafter, before use, exchanged for another article of a higher price, the purchaser paying the difference, the vendor should pay the tax on the second sale, but may take as a credit against such tax such part of the tax paid on the returned article, which the amount allowed as a credit for the return of such article on the second sale bears to the amount of the purchase price in the case of the first sale.

Art. 6. Credit for taxes already paid.—A manufacturer may take as a credit against the tax imposed on him in respect to the sale of any article taxable under Section 900 an amount equal to any tax imposed under Section 900 which he has reimbursed to the vendor from whom he purchased any article forming a component part (whether or not changed in form by process of manufacture) of the article sold by him and in respect to which tax is paid by him. No credit is allowable, however, for any tax so reimbursed by a manufacturer to the vendor in respect to any article, unless such article forms a component part of an article sold by such manufacturer and in respect to which a tax is payable by him. This credit will be allowed only if the taxpayer keeps such records and evidence as will clearly establish his right to the exemption. In cases of doubt, in order to avoid penalty for default if the claim is not established, the tax should be paid in full and application made for refund.

Art. 7. Who is a manufacturer?—(a) A manufacturer is a person who prepares a taxable article in marketable form. There are several cases, however, in which under Section 900 there may be several manufacturers, each of whom must pay a tax, as, for example, the tax upon "articles made of fur." In such case the tax may attach on successive sales, if there are several stages of manufacture. See, however, Article 6 as to credits in such cases.

(c) A person who is employed to make an article and receives for it the cost of materials and labor, plus a specified profit, shall be considered a manufacturing agent, and the person who procures the preparation of the article for purposes of resale will be considered the manufacturer.

Art. 8. Tax payable by the manufacturer.—The tax is to be paid by the manufacturer on all sales made directly by him or through an agent. If the manufacturer has a sales agent or sales agency to whom he only nominally sells an article, but retains an interest in the profits from the resale of the article, the taxable sale is that made by the sales agent or sales agency. On articles manufactured for a jobber by a foreign manufacturer, the jobber must pay the tax as the importer. A receiver or trustee in bankruptcy of a manufacturer conducting a business under court order is liable to the tax upon articles sold by him. Where a

manufacturer consigns articles to a retailer, retaining ownership in them until they are disposed of by the retailer, the manufacturer must pay the tax based upon the price for which sold by the retailer. See Article 34.

Art. 9. When tax attaches.—The tax attaches when the article is sold; that is to say, when the title to it passes from the vendor to the purchaser pursuant to a previous contract of sale or upon a sale without previous contract. When title passes is a question of fact dependent upon the intention of the parties as gathered from the contract of sale and the attendant circumstances. Where goods are segregated from other goods owned by the vendor and it is the intention of both the vendor and the purchaser at the time the goods are segregated that they shall then belong to the purchaser, the title will be presumed to pass at such time. In the absence of an intention to the contrary the title is presumed to pass upon delivery of the article to the purchaser or to a carrier for the purchaser. In the case of a conditional sale, where the title is reserved in the vendor until payment of the purchase price in full, the tax attaches (a) upon such payment, or (b) when title passes if before completion of the payments, or (c) when, before completion of the payments, the dealer disposes of the sale by charging off, by any method of accounting he may adopt, the unpaid portion of the contract price.

Art. 10. Sales to the Government or a State.—The tax applies to articles enumerated in Section 900 when sold to the Government. Where, however, the Government supplies a manufacturer with all materials and parts except a small portion furnished by the manufacturer, under a contract stipulating that the manufacturer shall be guaranteed a certain profit, no tax is payable, because the manufacturer does not sell the articles. Articles manufactured in plants taken over and operated by the Government are not subject to the tax. Articles sold to a State or a political subdivision thereof by the manufacturer for use in carrying on its governmental operations are not subject to the tax. Articles sold by the manufacturer to a State, county, or municipal institution are also exempt from tax when paid for entirely out of public money.

Art. 11. Automobiles: Scope of tax.—An automobile (as well as an automobile truck or automobile wagon) is a self-propelling vehicle designed primarily for the transportation in or upon it of persons or property. Motor-driven machines for pulling a vehicle around factories and railway stations and motor-driven machine gun carriages are not taxable. An automobile hearse and a pallbearers' coach are taxable under subdivision 2. A self-propelled fire engine, at least if designed to carry only such persons as are necessary to drive it, is not taxable. If, however, it is especially designed to carry firemen not employed in or about the driving of the machine, it is taxable as an automobile. Automobile trucks equipped as hook and ladder trucks, and hose carts for the use of firemen, are likewise taxable. A usable substantially completed automobile or automobile truck produced by assembling new parts of trucks or cars is subject to tax, but a rebuilt car is not subject to tax as such, although the new parts thereof are subject to tax when sold by the manufacturer, even though assembled into a car. Automobiles which have been sold by the manufacturer are not taxable when sold again. Where, however, a manufacturer sells again an automobile which he has once sold and which has been returned to him and the first sale rescinded, the tax attaches on the second sale. A tractor is not taxable.

Art. 12. Automobile trucks and automobile wagons.—The tax is 3 per cent of the price for which automobile trucks and automobile wagons are sold by the manufacturer. An automobile truck or automobile wagon is a self-propelling vehicle primarily designed or adapted for the transportation of property. The act specifically exempts tractors; even if sold in combination with a trailer. Any tires, inner tubes, parts or accessories for automobile trucks and automobile wagons sold on or in connection therewith or with the sale thereof are taxable at 3 per cent. Such tires, inner tubes, parts and accessories, however, as (although sold on or in connection with an automobile truck or automobile wagon or with the sale thereof) are in excess of the quantities usually sold in the ordinary course of trade to a single customer at the time of the purchase of an automobile truck or wagon, will not be taxable at 3 per cent, but will be taxable under subdivision (3) of section 900 at the rate of 5 per cent.

Art. 13. Other automobiles and motor-

cycles.—The tax is 5 per cent of the price for which such articles are sold by the manufacturer. It applies to all automobiles primarily designed for carrying persons, including passenger cars, taxicabs, auto-buses, sight-seeing cars and also to all motorcycles, including side cars. Where an automobile chassis, although of such construction as is ordinarily used in automobile trucks, is fitted with a body designed for the carriage of persons, or for the carriage of persons and property, the completed whole is taxable at 5 per cent of the price for which sold by the manufacturer, and not under subdivision (1) at 3 per cent. Tires, tubes, parts and accessories for motorcycles or automobiles other than automobile trucks or automobile wagons sold on or in connection therewith or with the sale thereof are taxable at 5 per cent.

Art. 14. Tires, inner tubes, parts and accessories sold to manufacturer.—Subdivision (3) of section 900 of the act provides that tires, inner tubes, parts or accessories shall be exempt from the tax if sold to a manufacturer or producer of automobile trucks, automobile wagons, other automobiles or motorcycles. To come within this exemption the sale must be to such a manufacturer for use by him in the manufacture or production of new cars or for free replacement under contract or guaranty. If sold to such a manufacturer for any other purpose, such as resale to a dealer or for the rebuilding of used cars, the sale is taxable. In order for the sale to come within the exemption of the statute, the manufacturer must at the time the goods are shipped or sold (whichever is prior) have in his possession an order or contract of sale, with certificate of the purchaser in writing printed thereon or permanently attached thereto, showing that the tires, inner tubes, parts, or accessories so purchased are to be used in the manufacture or production of new cars or for free replacement under contract or guaranty. If in any case such an order and certificate cannot be produced on demand of any authorized agent of the department the tax in respect to the sale will be considered in default.

Art. 15. Definition of parts.—A "part" for an automobile truck, automobile wagon, other automobile, or motorcycle is any article designed or manufactured for the special purpose of being used as or to replace a component part of any such vehicle, and which by reason of some peculiar characteristic is not such a commercial commodity as would ordinarily be sold for general use, and which is primarily adaptable only for use as a component part of such vehicle. Mere stock or commercial commodities such as bolts, nuts, washers, screws, though used as components for such vehicles, are not "parts" within the meaning of subsection (3) of Section 900. Articles, however, which ordinarily would be classed as commercial commodities become parts when, because of their design or construction, they are primarily adaptable for use as component parts of such vehicles. Component parts of articles taxable under this definition are taxable when sold separately, if they have reached such stage of manufacture that they are primarily adaptable for use as such a component part. Thus plates, jars, and separators for automobile storage batteries are taxable when sold separately. A chassis is a part of an automobile and taxable at the rate of 5 per cent when sold separately regardless of whether it is a chassis for an automobile truck or wagon, or for any other kind of automobile. An automobile body is also a part of an automobile.

Art. 16. Definition of accessories.—An "accessory" for an automobile truck, automobile wagon, other automobile, or motorcycle is any article designed to be attached to or used in connection with such vehicle to add to its utility, and which is primarily adaptable for use in connection with such vehicle, whether or not essential to its operation. The term "accessories" includes, for example, horns, speedometers, self-starters, spot-lights, shock absorbers, tire pumps, pressure gauges, and hydrometers. All such articles primarily adapted for use in connection with an automobile are subject to the tax even though they may sometimes be used otherwise, as for example, with motor boats. If any doubt, reasonable and bona fide, exists as to the special adaptability of an article the fact of its sale by the manufacturer to be used with an automobile or to an automobile accessories dealer will determine its taxability. A wrench or other tool of a kind sold in hardware stores for general purposes is not subject to the tax, but a wrench or other tool of special design or construction primarily adapted to be used in connection with automobiles will be subject to the tax. Robes, goggles, and lunch kits are not subject to the tax. Automobile trailers, regardless of the number of wheels

which they may have, are not parts of or accessories for automobiles; but rear portions of automobile trucks, automobile wagons, or other automobiles, not properly called trailers, are taxable as a part of the automobile. Where a manufacturer sells automobile accessories or parts to a jobber who in turn sells them to a manufacturer of completed cars the tax upon the accessories or parts is payable by the manufacturer who sells them to the jobber. Where a manufacturer sells material to an accessories manufacturer who in turn sells the accessories constructed from them to a manufacturer of completed automobile trucks, automobile wagons, other automobiles, or motorcycles, except tractors, the manufacturer of the completed vehicle is liable for the tax upon his sales and no tax is due upon such previous sales.

Art. 34. Manufacturer also retailer.—By "customarily sells" is meant a bona fide practice of selling the same article at both wholesale and retail, in substantial quantities, and not mere occasional sales at wholesale, with the bulk of the business done at retail. Only a manufacturer who does both a wholesale and retail business and holds himself out as a wholesaler as well as a retailer with respect to the goods sold will be entitled to compute the tax upon goods sold at retail on the price for which like articles are sold by him at wholesale. As to articles sold at wholesale, the tax paid must be based on the actual selling price of each article sold. As to sales at retail, the tax on each sale made during any calendar month must be based on the average wholesale price of all sales of like articles made at wholesale during the previous calendar month. This average wholesale price is to be obtained by dividing the sum of the actual selling prices of all such articles sold at wholesale during such previous calendar month by the total number of such articles so sold.

Art. 35. Repeal of former taxes.—The present taxes supersede the excise taxes imposed by the Revenue Act of 1917 upon the sale of automobiles, musical instruments, sporting goods, chewing gum, cameras, toilet soaps and similar articles. The Revenue Act of 1917 remains in force for the assessment and collection of all taxes which have accrued thereunder, and for the imposition and collection of all penalties or forfeitures which have accrued and may accrue in relation to any such taxes. In the case of any tax imposed by the Revenue Act of 1917, if there is a tax imposed by the present statute in lieu thereof, the provision imposing such tax remains in force until the corresponding tax under the present statute takes effect. See Section 1400 of the statute.

Art. 36. Colorable sales.—If a manufacturer, through the device of a selling branch or in any other manner, contrives to sell under the market price, with the result of benefiting his business or with the intent to cause such benefit, the tax shall be based on the fair market value of the articles and not on their nominal selling price. See Article 8.

Art. 37. Return and payment of tax.—Each manufacturer of any of the articles hereinabove enumerated must make monthly returns under oath in duplicate and pay the taxes imposed on such articles to the collector of internal revenue for the district in which his principal place of business is located. Any return may, if the amount of the tax covered thereby is not in excess of \$10, be signed or acknowledged before two witnesses instead of under oath. The returns shall be made on form 728 (revised). Instructions for preparing will be found on the back of the form. The returns are to be rendered and the tax paid on or before the last day of each month covering all the transactions of the preceding month, the first return to cover all transactions after Feb. 24, 1919, and before April 1, 1919. Branch houses should in general make reports to the parent house, which is liable to make monthly returns of the sales of the branch house. An itinerant manufacturer should make return and pay the tax to the collector of the district where the sales were made. The books of every person liable to the tax shall be open at all times for inspection by examining internal revenue officers. As to penalties, see Article 40.

Art. 38. Trade with possessions of United States.—A sale which results in the shipment of articles into the United States from the Virgin Islands is taxable to the same extent as a sale of articles within the United States. Articles going into the Virgin Islands from the United States are free from tax in the United States. The same rules apply to trade with Porto Rico and the Philippine Islands. See Section 1000 of the Revenue Act of 1917 and Section 5 of the Act of Aug. 4, 1909, as amended by Section 4, subdivision C, of the Act of Oct. 3, 1913. The tax attaches, however, to articles shipped to

other possessions of the United States, including the Canal Zone.

Art. 39. Aids to collection of tax.—In collecting the excise taxes the Commissioner has the benefit of all existing internal revenue laws. In aid of the enforcement of the statute the Commissioner may require any person to keep specified records, to render returns and statements as directed to submit himself and his books to examination, and to comply with such regulations as may be prescribed.

Art. 40. Penalties.—Any person, including an officer or employee of a corporation and a member or employee of a partnership in the course of his duty, who fails to pay or collect a tax or to make a return, is liable to a penalty of \$1,000. If his failure is willful, or he otherwise tries to evade the tax, he is guilty of a misdemeanor and liable to a fine of \$10,000 and imprisonment for a year. If his failure is willful, he is also liable to the addition to the tax of a 25 per cent penalty for failure to make a return and a 50 per cent penalty for a fraudulent return.

Art. 41. Credits and refunds.—If a manufacturer overpays the tax due with one monthly return, he may take credit for the overpayment against the tax due with a succeeding return. If under Section 1312 of the statute or otherwise he similarly overcollects the tax, he shall refund the overcollection to the purchaser from him. If in a case under Section 1312 he sells on credit, other than on conditional sale, he shall return the tax at the time of the sale, but may defer collection of it from the purchaser. See Articles 44-46. For the procedure with reference to claims for refund see Sections 3220 and 3225 of the Revised Statutes, as amended by Section 1316 of the Revenue Act of 1918, and Regulations No. 14 (revised).

Art. 42. Exemption of export sale.—The tax does not attach to the sale of an article which is either (1) shipped direct to a foreign destination by the manufacturer himself, or (2) both (a) sold by him for export and (b) in due course so exported by the purchaser. Where a manufacturer at the time an article is sold or shipped (whichever is prior) has in his possession an order or contract of sale showing in writing (1) that the manufacturer is to export the article, or (2) that the purchaser is buying the article in order to export it prior to its being used or subjected to further manufacture, there is a presumption that the sale of the article is exempt from tax, as an export sale, and the manufacturer may, for a period of six months from the date of sale or shipment (whichever is prior), rely on such presumption. This temporary presumption becomes a permanent presumption upon the manufacturer's receiving, and attaching to such order or contract, before the termination of such period of six months, due "proof of exportation" (see Article 43) of such article. On the other hand, if, within such period of six months, the manufacturer has not received, and attached to such order or contract, such "proof of exportation," then the temporary presumption that such sale is an export sale disappears, and the manufacturer shall include a tax on the sale of such article in his return for the month in which such period of six months expires. The order or contract of sale and the "proof of exportation" must be preserved by the manufacturer in such a way as to be readily accessible for inspection by internal revenue officers. No sale shall be considered to be exempt from tax under Section 1310 (c) of the act, unless its character as an export sale has been established in accordance with the above provisions.

Art. 43. Proof of exportation.—By the term "proof of exportation" is meant: (1) An affidavit containing the following information: The name and address of the manufacturer, the name and address of the exporter (who, if not the manufacturer, must be a person who has purchased direct from the manufacturer), the respective dates of the sale or shipment (whichever is prior), and exportation of the article, the price for which purchased, the fact that the article has been exported by the manufacturer or original purchaser without having been used or subjected to further manufacture, the name of the port of foreign destination, the name and address of the carrier issuing the export bill of lading, and any further information necessary to identify the article sold with the article exported; and (2) attached to such affidavit a copy of the export bill of lading, or a certificate by the agent or representative of the export carrier showing the exportation of the article, or, if exported by parcels post, a copy of the certificate of mailing.

Art. 44. Contract of sale before May 9, 1917.—If before May 9, 1917, A, a manufacturer, made with B, a wholesaler, a contract

of sale which does not permit the addition of the tax to the amount payable under the contract, then the liability for the tax is on B, with the duty on A only to collect and pay it to the collector as provided in Article 47. If B also made before May 9, 1917, a contract of the character described with C, a retailer, the liability for the tax thus imposed on B is transferred from B to C, B being obliged only to collect the tax from C and to pay it over to A for payment to the collector. If, however, any person before May 9, 1917, made a contract of the character described with any person other than a dealer as defined in Article 48, no tax is payable in respect of the sale by him, since on May 9, 1917, no tax was in force on the sale of any of the articles described in these regulations.

Art. 45. Contract of sale before Sept. 3, 1918, of article not then taxable.—If before Sept. 3, 1918, A, a manufacturer of candy or other article not taxable under the Revenue Act of 1917, made with B, a wholesaler, a contract which does not permit the addition of the tax to the amount payable under the contract, then the liability for the tax is on B, with the duty on A only to collect and pay it to the collector as provided in Article 47. If B also made before Sept. 3, 1918, a contract of the character described with C, a retailer, the liability for the tax thus imposed on B is transferred from B to C, B being obliged only to collect the tax from C and to pay it over to A for payment to the collector. If, however, any person before Sept. 3, 1918, made a contract of the character described for the sale of candy with any person other than a dealer as defined in Article 48, no tax is payable in respect of such sale by him.

Art. 46. Contract of sale before Sept. 3, 1918, of article then taxable.—If before Sept. 3, 1918, A, a manufacturer of chewing gum or other article taxable under the Revenue Act of 1917, made with B, a wholesaler, a contract which does not permit the addition to the amount payable under the contract of the difference between the present tax and the corresponding tax imposed by the Revenue Act of 1917, then B is liable for such difference. A must collect and pay to the collector as provided in Article 47 the portion of the tax for which B is so liable, and he must also include in his return and pay the portion of the tax for which B is not so liable. If B also made before Sept. 3, 1918, a contract of the character described with C, a retailer, the liability for the tax thus imposed on B is transferred from B to C, who is liable for the difference between the tax imposed by the present statute and the tax imposed by the Revenue Act of 1917. B must collect and pay over to A for payment to the collector the portion of the tax for which C is so liable. For example, if any person made before Sept. 3, 1918, a contract of the character described for the sale of chewing gum with any person other than a dealer as defined in Article 48, the tax to be collected under the present statute will be the tax in force on Sept. 3, 1918; that is, the tax under the Revenue Act of 1917.

Art. 47. Return of tax.—Each person receiving any payments referred to in Section 1312 of the statute shall collect the amount of the tax, if any, imposed by such section from the person making such payments, and shall make monthly returns under oath in duplicate and pay the taxes so collected to the collector of the district in which his principal office or place of business is located. Any person making a refund of any payment upon which the tax is so collected may repay therewith the amount of the tax collected on such payment; and the amount so repaid may be credited against amounts included in any subsequent monthly return. The return shall be made on Form 728 (revised) on or before the last day of the month following the month in which the sale is made, as provided in Article 37. The tax shall without assessment by the Commissioner or notice from the collector be due and payable to the collector at the time fixed for filing the return. If the tax is not paid when due, there shall be added as a part of the tax a penalty of 5 per cent, together with interest at the rate of 1 per cent for each full month from the time when the tax became due.

Art. 48. Meaning of "dealer."—The term "dealer" includes not only dealers in the ordinary sense—that is, persons engaged in the business of selling articles—but also a person who purchases an article with the intention of using it in the manufacture or production of any article intended for sale. The term does not include a person buying an article for his personal consumption or use. The United States, a State, Territory, or a political subdivision thereof, or a foreign government, purchasing an article for its own use is not a dealer.

Art. 50. Payment of tax by uncertified check.—Collectors may accept uncertified checks in payment of excise taxes, provided such checks are collectible at par; that is, for their full amount, without any deduction for exchange or other charges. The collector will stamp on the face of each check before deposit the words "This check is in payment of an obligation to the United States and must be paid at par. No protest," with his name and title. The day on which the collector receives the check will be considered the date of payment so far as the taxpayer is concerned, unless the check is returned dishonored. If one check is remitted to cover two or more persons' taxes, the remittance must be accompanied by a letter of transmittal stating (a) the name of the drawer of the check; (b) the amount of the check; (c) the amount of any cash, money order, or other instrument included in the same remittance; (d) the name of each person whose tax is to be paid by the remittance; (e) the amount of the payment on account of each person; and (f) the kind of tax paid.

Art. 51. Procedure with respect to dishonored checks.—If the bank on which any such check is drawn should refuse to pay it at par, the check should be returned through the depository bank and be treated in the same manner as a bad check. All expenses incident to the attempt to collect such a check and the return of it through the depository bank must be paid by the drawer of the check to the bank on which it is drawn, since no deduction can be made from amounts received in payment of taxes. See Section 3210 of the Revised Statutes. If any taxpayer whose check has been returned uncollected by the depository bank should fail at once to make the check good, the collector should proceed to collect the tax as though no check had been given. A taxpayer who tenders a certified check in payment for taxes is also not released from his obligation until the check has been paid. See Chapter 191 of the Act of March 2, 1911.

Art. 52. Misrepresentation of tax.—If a manufacturer or other vendor misrepresents the tax, he is guilty of a misdemeanor and is liable to a fine of \$1,000 and to imprisonment for a year. This provision is designed, among other things, to prevent a vendor adding more than the amount of the tax to the price of an article and representing that the increase is due to the tax.

(Continued from page 1030)

The company learned that on Saturday night the union instructed its members to quit at 3.30 o'clock Monday. On Sunday the company posted notices on all bulletin boards in the plant outlining the situation, and stating that men who left at the end of 8 hours did so against the rules of the company and were no longer in the company's employ. When the men quit, their cards were immediately pulled, and steps taken to replace them with other men.

"It may take a few days and it may take two or three weeks to settle this affair, but we are going to settle it to the perfect satisfaction of all concerned," said Mr. Earl.

Rolls Royce to Manufacture in America

NEW YORK, May 7—Rolls Royce, Ltd., London, England, is preparing to manufacture in America. No definite location has yet been named, but it is understood that the plant will be somewhere in the eastern part of the United States, where Rolls Royce cars will be manufactured complete.

Johns-Manville Denver Office in New Quarters

NEW YORK, May 6—The Denver office of the H. W. Johns-Manville Co. moved from the Denver Gas & Electric Bldg. to the Iron Bldg., 1021 17th Street. Louis H. Inglee remains as manager of this branch.

20,000 Army Trucks For Roads

Part of Surplus Stock of 31,000
—None Left for Sale to
Makers or Public

WASHINGTON, May 8—Twenty thousand motor trucks are being turned over to the Bureau of Public Roads, Department of Agriculture, by the War Department to be distributed to the various states for use on road construction. These trucks are part of the 31,000 which were recently declared surplus by the War Department, and this disposition of them actually insures that there will be no trucks available for sale to the public or for resale to the manufacturers. The Post Office Department has requisitioned 7000, and it is expected that other Government bureaus will absorb the remaining 4000.

The trucks turned over to the Department of Agriculture are valued at \$45,000,000, and include 11,000 new and 9000 used vehicles ranging from 2- to 5-ton capacity, all in serviceable condition.

The trucks are turned over under provisions of the Post Office Appropriation Bill, which authorizes requisition of surplus trucks from the army by the different Government departments. They must be used by the states on road construction under the Federal Road Aid Act. The only charges which the states will pay will be for loading and freight. The trucks will be apportioned to states only upon request of the State Highway Department on the basis of the requests received and in proportion to the financial apportionment under the Federal Road Act.

Will Retain Standard Vehicles

WASHINGTON, May 7—The standard types of trucks and passenger cars purchased for the army during the war will be used to replace all of the non-standard vehicles at the various army camps and posts in this country and the non-standard vehicles will be disposed of. They will be turned over to various Government bureaus, and if not entirely absorbed by them the manufacturers will be given the opportunity to buy them back from the Government. Arrangements for these plans are being completed. The standard vehicles include the B 3-ton, A 1½-ton and AA ¾ to 1-ton trucks, the four wheel drive and the passenger car standards are the Cadillac, Dodge and Ford.

Willys Export Corp. Formed

NEW YORK, May 6—The John N. Willys Export Corp. has been formed to absorb the export department of Willys-Overland, Inc. It has opened offices in the City Investing Building, 165 Broadway, and will direct export sales for a number of Overland interests, chiefly the Willys-Knight and Overland cars. Associated with Mr. Willys are E. C. Morse as vice-president and general

manager, and John Macfadyean, vice-president in charge of sales.

Mr. Morse at the present time is in Europe, where he has been since the beginning of February studying the foreign markets. He is expected to return the end of this month.

Mr. Morse's first connection with the automobile industry was as commercial manager of the E. R. Thomas Co., Buffalo, which marketed the output of the E. R. Thomas-Detroit Co. Upon the organization of the Hudson Motor Co. he was made sales manager. In 1916 he resigned to become vice-president of the Chalmers Motor Co., of which he was also general manager. Nearly two years ago he joined the Willys-Overland interests and represented the company in Washington during the war.

Mr. Macfadyean was with the Goodyear Tire & Rubber Co. from 1909. He was first branch manager, then district manager and finally manager of the export department. He was also vice-president of the Goodyear Tire & Rubber Co. of South America.

New Industries in Saginaw Complicate Housing Question

SAGINAW, May 6—The housing situation in Saginaw is acute, and the business interests of the city, through the Chamber of Commerce, are exerting every influence to get people to build. The banks are aiding in this campaign. The housing situation here is attributed solely to the surprising number of new industries that have come to the city in the last two years, calling in thousands of people. Hundreds of homes are now in the course of construction.

Smith Leaves Buda for Midwest

INDIANAPOLIS, May 7—Lon R. Smith has resigned as sales manager of the Buda Co., Harvey, Ill., effective June 1, to become general sales and advertising manager of the Midwest Engine Co., Indianapolis. The Midwest Engine Co. was formed last year to take over the Lyons-Atlas Co. and the Hill Pump Co. It is capitalized at \$3,500,000 and will produce oil engines and centrifugal and reciprocating pumps.

Mechanical Engineers to Meet at Detroit

NEW YORK, May 7—The spring meeting of the American Society of Mechanical Engineers will be held at the Hotel Statler, Detroit, June 16 to 19. On the opening day there will be a business meeting in the afternoon, followed by a general meeting at which the society's committee on aims and organization will make a preliminary report.

Papers on industrial research will be read at the morning session on June 17, which will be under the auspices of the research committee. This is to be made a leading topic of the meeting, because of the great impetus which has been given to industrial research through war conditions. The afternoon session on the 17th will be devoted to the subject of industrial relations, and there will be a

symposium by leading organizers on the factors dominant in the labor situation. On June 18 there will be a gas power session with papers on oil engines, and the closing session on June 19 will deal with powdered fuel and oil fuel.

Receiver for Campbell Appointed

NEW YORK, May 7—The Campbell Motor Car Co., which emerged as the result of the reorganization of the Emerson Motors Co., Kingston, N. Y., in September, 1917, has been placed in the hands of a receiver. It is stated that the action is a friendly one, brought about largely through a shortage of ready cash, and that there is a strong probability that the company will be reorganized. In the meantime the receiver is to continue the business. The action to have receivers appointed was brought by Abel L. Smith, who holds 166 1/3 shares of the company's stock. The receivers are Marcus Helfand and E. V. Wilson.

Not long after the Emerson company was reorganized into the Campbell company certain contracts were entered into with the United States Government, the Y. M. C. A. and the Overseas Corp. for the delivery of ambulances. All of these contracts were cancelled, however, before the company got into production on them. It is stated that the company is at present solvent, though President J. A. Campbell admits that debts amounting to some \$60,000 are pressing.

Uncompleted Ordnance Contracts

WASHINGTON, May 5—Tank and tractor contracts totaling \$57,469,700 have been cancelled, and all cancellation negotiations have been completed regarding them. Contracts totaled at \$136,067,300 have been suspended with the suspension accepted by the contractor. Orders totaling \$27,357,300 have been ordered suspended. Nine per cent of the orders outstanding for tanks and tractors valued at \$72,328,000 remain to be completed.

Motor Contracts Outstanding

WASHINGTON, May 5—Of \$419,184,000 worth of orders for motor trucks and other motor vehicles outstanding on Nov. 11, 1918, there were \$18,023,000 left on order on April 1. Of the total, 67 per cent were canceled, 29 per cent delivered, leaving a balance of 4 per cent due.

No Motor Driven Fire Fighting Equipment Sold

WASHINGTON, May 5—Motor driven fire fighting equipment that has been purchased by the Army is not for sale, and will not be sold, according to a statement made to-day by the Director of Sales.

Sell Castor Oil and Castor Beans

WASHINGTON, May 5—The Bureau of Aircraft Production sold castor oil and castor beans, forming a surplus above the needs of the Air Service, valued at \$332,927.89.

Industry Waiting for Steel to Drop

Expect Lower Price Through Railroad Administration—Buy Only for Immediate Needs

DETROIT, May 5—The steel situation in Detroit has not changed in the last two weeks. An open market prevails, with most companies purchasing only enough to cover immediate needs and very few contracting for the season's output. Some of the large automobile companies are covering themselves by contracts, but the majority are not. The trade is uncertain. Some purchasing agents are looking for a further drop in price below that recently fixed by the government. They argue that the Railroad Administration, which refuses to pay the price fixed by the government and the steel interests, will ultimately win out and bring the market further down.

Others declare the steel price is at rock bottom now, but are withholding their orders due to the uncertain conditions abroad. They are waiting until conditions clarify, which they hope will occur in the next few weeks. They predict that there will be no buying to speak of until the peace conference is over, a definite government reconstruction policy announced, Congress again in session, and the Railroad Administration and the steel interests settled upon a standard price.

One purchasing agent for an automobile company which will build 40,000 cars this year sums up the situation as follows:

"We are buying steel only as we need it. We are not contracting for any fixed amount. We are having no trouble in getting steel, but we expect the price will drop materially, and we are waiting for that drop before buying heavily.

"There is no question in my mind but what the price is going down. I say that because of the difference between the basic price of steel before the war and the price to-day. Prices dropped somewhat after the signing of the armistice, but there is still an increase of over 100 per cent over the price in 1914. I do not know what the increased cost of steel manufacture amounts to, but I do not think it is sufficient to merit upholding the present price.

When the government Railroad Administration and the steel interests agree upon a price of steel for the railroads, the automotive industry is going to benefit by the same reduction, regardless of the present price which has been regulated by the government. The automotive industry is nearly as great a steel consumer as the railroads. The big automobile companies have been buying in fair quantity, while the railroads, building industries and other consumers have been holding back. It is a broad statement, but I believe that the automotive industry has saved the steel companies from a stagnant market, and there is no reason why we should not benefit greatly

if the Railroad Administration should succeed in getting a further price cut."

British Steel Manufacturers Disturbed by American Prices

LONDON, April 19—The recent cut in American prices of \$4.25 for pig iron and \$12 for finished steel brings the American price so far below British prices that many of England's manufacturers feel her domestic and foreign markets are both threatened. At the revised prices, 4-inch billets bring \$38.50 per gross ton in America, while the British figure is \$61.25. The American price for galvanized sheets is about \$105 per ton, and the British \$140. When the British government removes its subsidy from pig iron, the price is expected to advance at least \$5. Sellers cannot quote prices for future business, and as a result business is slowing up. As Great Britain doubled her steel market capacity during the war, manufacturers would feel the loss of her market keenly. As a result import restrictions are being urged by some manufacturers to protect their market.

Germany May Buy Copper Soon

WASHINGTON, May 6—It is expected that Germany will be in the market for copper within the next few months. At present there is a surplus of about 2,000,000 lb. of copper. Copper producers are operating at about 50 or 60 per cent capacity, but the demand is said to be increasing and it is also expected that countries which have been cut off from supplies during the war will help reduce the surplus. The embargoes against copper still hold in France and Italy, but, it is believed, will not continue much longer. England has already removed all copper import restrictions.

N. Y. Amends Law to Permit Aerial Insurance

ALBANY, N. Y., May 6—Three bills, amending the state insurance laws to permit marine, fire and casualty insurance companies to insure against loss or damage to airplanes, seaplanes, dirigibles and other aircraft have been signed by the Governor. The Governor also signed the Booth bill requiring motor trucks operating on state highways to be equipped with mirrors or some reflecting device giving drivers a view of the road in the rear.

Maxim Drops Maxim Silencer

MILWAUKEE, May 2—The Geuder, Paeschke & Frey Co. is now manufacturing the Maxim silencer formerly manufactured by the Maxim Munitions Corp.

Dort Producing 100 Daily

FLINT, May 1—The Dort Motor Car Co. is running more cars daily than ever before since it was organized. Daily production is hitting the hundred car mark. The entire production for the

months of May and June is already contracted for.

Hereafter the Earl C. Anthony Co., Inc., will handle Dort distribution on the Pacific coast. This company succeeds the Frawly Motor Car Co. of San Francisco as coast distributors, and the Leach Motor Car Co. of Fresno as distributors. The Anthony company's headquarters are in Los Angeles, but the firm maintains seven branches throughout the state, being represented in San Francisco, San Diego, Fresno, Stockton, Sacramento, Oakland and San Jose.

Briscoe Carbureters to be Made in Pontiac

PONTIAC, MICH., May 3—The Briscoe Carburetor Co. of Jackson is about to move to this city. Frank Briscoe, former automobile manufacturer, is at the head of this company which is now producing carbureters on a small scale. Ground has been broken here for the new plant. It will be a 1-story concrete structure, 60 x 200 ft. The plant is to be completed and the company in production within the next 70 days. About 40 men and women will be employed at first. The Briscoe carburetor is designed principally for use on Ford cars.

Mitchell Plans for 100 a Day

RACINE, May 2—The Mitchell Motors Co. completed its government four-wheel drive truck contract last week, and is now returning to commercial production as quickly as possible. It is expected that the plant will reach a production of 100 cars a day within the next month.

Capacity for 500 Studebakers a Day

SOUTH BEND, May 2—The Studebaker Corp. will have capacity for 500 cars per day when the extensive additions now building here are completed. These will include a group of buildings to occupy 61 acres and give from 3,000,000 to 4,000,000 sq. ft. of floor space; 12,000 persons will be employed. This is all in addition to the present Studebaker plant.

Wallis Tractor Production Doubled

RACINE, May 2—Production of the Wallis tractor is to be more than doubled within the next month. The factory has been partly closed for the installation of new equipment and a progressive assembly system. It is estimated that the plant will be in complete production by June 1, increasing from its present rate of 10 to 24 tractors per day.

Melling Resuming Operations

LANSING, MICH., May 2—The Melling Forging Co., recently destroyed by fire, will shortly resume operations with two shifts. Previous to the fire the plant was in operation with three 8-hr. shifts. Repairs to the building are nearly complete.

Hudson Super-Six Reduced \$225

New Models Incorporate Many Body Refinements—Color Schemes Different

DETROIT, May 5—A price reduction of \$225 has been made in the 7-passenger Hudson Super-Six and the other models have been reduced on a corresponding scale. In connection with this announcement there is also the announcement of a number of refinements in detail. The springs have been modified and longer shackles used to give a flatter suspension and better riding qualities. The frame has been increased to 7 in. in depth and a new square cross-member has been added in front of the gasoline tank at the rear of the chassis for greater rigidity. The rear axle has also been strengthened. There is a stronger ring and pinion gear and an improved adjustment of the ring gear. The wheels have solid rims and the tire equipment is now 34 x 4½ in. on all models. The front and rear wheels have 12 spokes.

The brakes have also been enlarged, the former size of 14 x 2 in. having been increased to 15½ x 2½ in. There have also been a few detailed changes, such as a larger horn, the license and lamp brackets attached to the cross-tube instead of the fender and an improved ignition switch, choke control and pilot lamp.

In the body works and control units the levers have been made longer, bringing them within easier reach of the driver. Gypsy curtains have been provided on both the 4 and 7-passenger phaetons.

In the 7-passenger phaeton the comfort, appearance and strength of the auxiliary seats have been notably improved. These seats are now upholstered in long grain leather pleated over Marshall springs. The steel braces supporting the backs of these seats have been leather covered. Scuff plates now cover the entire door opening and the door locks have larger bolts. Solid brass robe rails have also been provided. The robe rail now runs the width of the back of the front seat to provide a hand rest for passengers entering the tonneau, and all of the fixtures are nickel-plated.

New painting styles are also used on the Model O Super-Six. The body and wheels of the 7-passenger phaeton are finished in Valentine blue with black fenders. The body is striped in white and the hood louvres and wheels are also painted in the same manner to bring out the lines of the car. The body of the 4-passenger phaeton is finished in the same shade of blue as the 7-passenger, but the wheels are vermilion and the striping on the body bevel and louvres sets off the 4-passenger lines.

The cabriolet and sedan are also finished in Valentine blue throughout and matched with the cloth upholstery. The coupé and touring limousine are finished in light Brewster green, deep

maroon and Valentine blue, and are upholstered in harmonizing fabrics. Following are the new and old prices:

	New Price	Old Price
Seven-passenger phaeton.	\$1,975	\$2,200
Four-passenger phaeton.	2,075	2,300
Cabriolet	2,450	2,750
Sedan	2,775	3,000
Coupe	2,950	3,100
Touring limousine.....	3,300	3,400
Limousine	3,650	3,650

Hayes Wheel to Occupy Old Buick Plant

JACKSON, MICH., May 3—The Hayes Wheel Co. has leased the old Buick plant, which was occupied during the war by the Jackson Munition Corp. The Hayes company will use the plant for the manufacture of tractor wheels. The plant was used by the Imperial and Mutual Motors for car manufacture after it was abandoned by the Buick. The last car made there was the Marion-Handley.

Ignition Plug Co. Locates in Louisville

LOUISVILLE, May 5—The Ignition Plug Co., Dayton, has established a plant at 14th Street and Broadway and is preparing to manufacture spark plugs. The company is capitalized for \$50,000, with the following officers: President, E. R. Stucky; vice-presidents, H. C. Smith and C. D. Rodman; secretary and treasurer, W. T. O'Neal; assistant secretary, A. C. Reager.

Van Dorn & Dutton Open Branches

CLEVELAND, May 5—The Van Dorn & Dutton Co. has opened branches in New York and Chicago. Harry F. Keegan will manage the Chicago office at 1241 First National Bank Bldg. His brother, John, will manage the New York office at 30 Church Street.

Huffman Bros. to Make Trucks

ELKHART, IND., May 2—Huffman Bros. Motor Co., formed recently, has secured a plant in which will be manufactured two types of medium priced trucks. One with internal final drive is listed at \$1,495, and the other, with worm-gear final drive, is listed at \$1,695. W. L. Huffman is president of the company, and other officers are: Vice-president, F. C. Huffman; treasurer, Leroy Huffman; secretary, Verne C. Cawley; general manager, R. S. Wiltrout; sales manager, N. L. Kuhn.

Arrow Grip to Have New Plant

GLENS FALLS, May 3—Ground will be broken at once for the new plant of the Arrow Grip Mfg. Co., to be erected on a 4-acre plot on Dix Avenue. The company has been reorganized and new directors added. The following officers were elected at its annual meeting: President, George Tait; vice-president, William H. Denning; secretary and sales manager, E. G. Mertens; treasurer, William H. Gelshenen; assistant treasurer and general manager, T. M. Avery. The officers and George F. Underwood, C. F. Burns, and G. F. Bayle, Sr., form the

board of directors. The Arrow Grip Mfg. Co. is incorporated for \$500,000, of which \$300,000 capital stock has been paid in.

Indianapolis Entries Total 43

NEW YORK, May 5—On May 1, the closing of the entries for the Indianapolis 5-Mile Victory Sweepstakes race for May 31, 43 entries appear on the lists. There are still four drivers to be named, for a Hudson special, a Detroit special and two Premiers. Omar Toft will drive his old Miller special under the new name of Darco special. Tom Alley has entered with a Bender special, a car built by him for C. J. Bender, president of the Ahlberg Bearing Co. The car has a 4-cylinder engine, with 3½ in. bore and 7 in. stroke, giving a displacement of 289 cu. in.

Only 33 out of the 43 entered for the race on May 31 will be permitted to start, as a rule of the American Automobile Association limits the number of cars in any speedway race to one for every 400 ft. of track. Beginning May 27, time trials will be held on the Indianapolis speedway to eliminate ten cars. Each contestant will be permitted three trials for speed in a single circuit of the 2½-mile track, the best record standing. No entrant who cannot show a greater speed than 80 m.p.h. will be permitted to enter. Starting positions for the contest will be awarded in the order of the speed shown in the time trials.

The complete list of drivers and cars follow:

Clifford Durant	Chevrolet special
Dario Resta	Sunbeam
Jean Chassagne	Sunbeam
H. C. Simmons	Hudson special
J. M. Reynolds	Hudson special
Eddie Pullen	Hudson special
W. W. Brown	Richards special
Eddie O'Donnell	Duesenberg special
Wilbur D'Alene	Duesenberg special
Tommy Milton	Duesenberg special
Kurt Hitke	Roamer-Duesenberg
Jules Goux	Peugeot special
Ray Howard	Peugeot special
Arthur Klein	Peugeot special
Louis LeCocq	Roamer special
Ralph DePalma	Packard special
Earl Cooper	Stutz special
Ralph Mulford	Frontenac special
Louis Chevrolet	Frontenac special
Denny Hickey	Stickel special
Arthur Thurman	Thurman special
Elmer P. Shannon	Mesaba special
Eddie Hearne	Durant special
Roscoe Sarles	Oldfield special
Dave Lewis	Duesenberg special
Omar Toft	Darco special
J. J. McCoy	McCoy special
A. E. Cotey	Ogren special
Ira Vail	Hudson special
Joseph Boyer	Frontenac special
P. W. Monahan	Johnson special
Andre Boillot	Peugeot special
	Detroit special
Gaston Chevrolet	Frontenac special
Tom Alley	Bender special
	Hudson special
	Premier
	Premier
Howard Wilcox	Premier

Foreign Drivers Arrive for Races

NEW YORK, May 6—Several of the foreign drivers scheduled to take part in the 500-Mile Victory Sweepstakes speedway race at Indianapolis on May 31 are already on their way here. René Thomas and Albert Guyot, two of the Ballot team, arrived in this city yesterday on board the Savoy. Paul Bablot

British Army Used 46,700 Motor Vehicles in France

PARIS, April 15—The British army in France made use of 46,700 motor vehicles, of which 30,000 were trucks. Despite this big mechanical fleet, the number of animals was constantly on the increase, and attained 400,000 horses and mules before the armistice was signed.

The British forces were responsible for the upkeep of 4500 miles of roadway. The traffic was of such a heavy nature that for one mile of ordinary road it was necessary to provide 100 tons of road material per fortnight for maintenance. During the month of October 85,000 tons of road material were carried weekly by motor truck, this involving a gasoline mileage of 14,000,000 weekly. The total amount of stone used for road maintenance from the beginning of 1918 to the date of the armistice was about 3,500,000 tons.

In his last official report, Sir Douglas Haig points out that mechanical appliances have not reduced the importance, in any degree, of infantry and artillery. As an instance of the interdependence of tanks and artillery it is stated that in the actions fought east of Amiens on Aug. 8, 1918, vast numbers of tanks were employed and carried out their tasks in the most brilliant manner. Yet the return of artillery munitions shows that in no action of similar dimensions had the expenditure of ammunition been so great.

While the war has given no new principles, the different mechanical appliances, particularly the rapid improvement and multiplicity of airplanes, the use of immense numbers of machine guns, the employment of vast quantities of barbed wire, the enormous expansion of artillery, and the provision of great masses of motor transport, have introduced new problems of considerable complexity concerning the effective co-operation of the different arms of the services.

and Louis Wagner, the remaining members of the Ballot four, sailed from Havre on May 4 on the Espagne, which is due on May 13. Andre Boillot, who will drive a Peugeot, is also a passenger on the Espagne.

American Police Aid French in Paris

PARIS, April 16—American military police now control automobile traffic on all the main avenues and boulevards of this city. The Americans are paired with French policemen and have authority not only over American drivers, but over French, English, Italian and other military cars, as well as over French civilians.

This scheme had to be adopted because of the international character of the automobile traffic in Paris and the growing recklessness of drivers. The Peace Conference has brought into the city more army drivers and more varied nationalities than during any period of the war. The United States is represented by the Army, the Navy, the

Y. M. C. A., the Red Cross, the K. of C., Salvation Army, as well as the military cars attached to the Peace Conference. The British have big military, naval, and air services in Paris. The Italians are almost equally important, while in addition there are Belgian, Polish, Greek, Roumanian, Portuguese, Jugo-Slav and other missions, all of which have important automobile services.

Discontinue Flying Fields

WASHINGTON, May 5—Ten flying fields will be abandoned by the War Department as soon as the equipment in storage at these fields can be disposed of. Other departments, including Interior, Commerce, Navy, Treasury and Agriculture, have been informed that these fields will be discontinued so that they can make use of them or the equipment if they desire. Following are the ten fields to be discontinued:

Barron Field	Fort Worth, Texas
Call Field	Wichita Falls, Texas
Carruthers Field	Fort Worth, Texas
Eberts Field	Lonoke, Ark.
Love Field	Dallas, Texas
Payne Field	West Point, Texas
Rice Field	Waco, Texas
Taliaferro Field	Fort Worth, Texas
Taylor Field	Montgomery, Ala.
Gerstner Field	Lake Charles, La.

Uniontown Entry List Lengthens

NEW YORK, May 5—The complete list of entries for the 112-mile Uniontown race for May 17 as received so far by the Contest Board of the American Automobile Association includes:

Louis LeCocq	Roamer special
Kurt Hitke	Roamer special
Eddie Pullen	Hudson special
Cliff Durant	Chevrolet special
Harold Simmons	Hudson special
Wilbur D'Alene	Duesenberg special
Dennie Hickey	Stickel special
Ray Howard	Peugeot special
P. W. Monahan	Johnson special
Joseph Boyer	Frontenac special
Louis Chevrolet	Frontenac special
Gaston Chevrolet	Frontenac special
Eddie Hearne	Durant special

British Import Restrictions Lifted

WASHINGTON, May 2—The restrictions on the importation of certain commodities, including Edison cells (and component parts) for electrically propelled vehicles, machine tools and parts, tools, appliances and parts, including abrasive wheels, drills, drill presses, drill sleeves and sockets, emery wheel dressers, hand and breast drills, lathe carriers and lathe dogs, have been removed by Great Britain, and according to a statement of the War Trade Board may be imported freely under general license.

The War Trade Board under special license will permit the importation of solid drawn weldless tubing in very special circumstances, as well as ball bearings, roller bearings, ball retainers, ball-bearing bolts and steel balls.

Webster Electric Gets Addition

RACINE, WIS., May 5—The Webster Electric Co. is preparing to build a two-story addition, to be used for an extension to the power plant as well as the factory. The enlargement is due mainly to the growth of the company's tractor ignition business.

Ungar Becomes Vice-President of SKF Ball Bearings

NEW YORK, May 2—G. A. Ungar, who has been engineer and technical director of the SKF Ball Bearing Co. for several years, has resigned to become vice-president of the company, of which he has been a director since its organization.

Seward in Charge of Walden-Worcester Office

WORCESTER, MASS., May 2—Walden-Worcester, Inc., has opened a New York sales office at 295 Broadway. Howard H. Seward is in charge.

Nonnes Gets Foreign Stock of Norma Ball Bearing

NEW YORK, May 5—Walter M. Nonnes, who has been president and general manager of the Norma Ball Bearing Co. since its formation in 1911, on Saturday purchased all of the foreign controlled stock of the company at a sale of the Alien Property Custodian. A total of 1950 shares, valued at \$500,000, thus becomes the property of Mr. Nonnes and his present business associates. The business will be enlarged and expanded as conditions warrant. Executive control of the business has been vested in Nonnes since the formation of the company, and there will be no changes in the administration.

Earl A. Stone, formerly manager of the Detroit branch of the Wheeler-Schebler Carburetor Co., Indianapolis, has been appointed sales manager of the company to succeed George T. Briggs, who resigned.

Fred W. Thomas has opened an office in Cleveland, Ohio, as consulting engineer. He was formerly chief engineer of the Olympian Motors Co., Pontiac, Mich.

Capt. Wakeman Hackett, recently released after 20 months in service, has become associated with the Oshkosh Motor Truck Mfg. Co., Oshkosh, Wis., as factory representative covering the Middle West.

H. H. Lotz, for many years with Lowe Bros. Co., has joined the sales force of the Hilo Varnish Corp. He will cover southern Ohio with headquarters at Dayton.

J. H. Weller, formerly assistant production manager of the Packard Motor Car Co., has been appointed assistant to B. W. Burtzell, president of the Herschell-Spillman Motor Co., North Tonawanda, N. Y., and will be in charge of production.

W. R. Mason, Albany, N. Y., has been appointed sales representative of the O. Armleder Co., Cincinnati, to cover the state of New York.

Men of the Industry

Changes in Personnel and Position

Guthrie Re-opens Engineering Office

CLEVELAND, May 2—Major James Guthrie, honorably discharged from the U. S. army, has re-opened his consulting engineering office at 420 Hickox Building, here. He served in the Ordnance Engineering Department at Washington for a year, and eight months as engineering manager of the Michigan Ordnance District.

Ferguson President of Chamber of Commerce

WASHINGTON, May 5—Homer Ferguson, president of the Newport News Shipbuilding Co., has been selected as president of the U. S. Chamber of Commerce for the coming year.

R. P. Leigh has been appointed factory manager of the Hackett Motor Car Co., Grand Rapids, whose plant has just been completed. It expects to be in production by July 1.

C. W. Jacoby has been appointed manager of the Philadelphia office and warehouse of Peter A. Frasse & Co., Inc., succeeding W. F. Moore who resigned.

May S. A. E. Meeting to Discuss Aviation

CHICAGO, May 6—The May meeting of the mid-west section of the Society of Automotive Engineers will be held at 1735 Monadnock Block, Friday, May 9, at 8 p.m. W. B. Stout, sales and aircraft manager of the United Aircraft Engineering Co., will tell of the lure of aviation, in which he will discuss present airplanes and their influence on car design, also future airplanes and engines. The second paper will be by O. E. Szekely, chief engineer and production manager of the Velie Motors Corp., on the development of kerosene burning fuel.

The meeting will be preceded by an informal dinner at 6.30 p.m. at the Chicago Engineers Club. Tickets are \$1.50. Friends of members and interested engineers are invited. Reservations for the dinner can be made through Francis W. Parker, 1410 Marquette Building.

E. B. Hayes Doubling Plant

OSHKOSH, Wis., May 5—The E. B. Hayes Machinery Corp., manufacturer of worm-drive axles for trucks, has under consideration plans for new buildings which will more than double the size of the plant and provide facilities for greatly increased production. Work probably will be undertaken during May so increased production may begin late in the summer.

Howard Spohn Again with Class Journal

NEW YORK, May 5—After something over two years as commercial manager of the U. S. Ball Bearing Mfg. Co., in Chicago, Howard L. Spohn has returned to the Class Journal Co. Spohn was connected with the Class Journal Co. for the 7 years previous to his going West, and upon his return to this city he is taking up the same general duties he was performing prior to his venture in the manufacturing world.

De Kam & Petit Open Engineering Office

William H. Petit, former chief engineer of the Olympian Motors Co., Pontiac, and Major C. T. De Kam, formerly of the Canadian forces, have united under the firm name of De Kam & Petit, with offices in Detroit, and will carry on general engineering work.

George Smith Heads Dixon Crucible

JERSEY CITY, May 5—George T. Smith was elected president of the Joseph Dixon Crucible Co. at the annual meeting recently; other officers elected being, vice-presidents, George E. Long and J. H. Schermerhorn; secretary, Harry Dailey; treasurer, William Koester; assistant secretary-treasurer, Albert Norris. The Philadelphia branch has been moved from 1020 Arch Street to the Finance Building. W. G. Stringer, Philadelphia district sales representative since 1912, continues in charge.

Willys Chairman of N. A. C. C. Show Committee

NEW YORK, May 6—The National Automobile Chamber of Commerce has appointed John N. Willys chairman of its show committee for the 1920 passenger car show. Other members of the committee are H. J. Root, Westcott, and H. M. Jewett, Paige. M. L. Pulcher, Federal, heads the committee on motor truck show, his associates being A. J. Whipple, Diamond-T, and David S. Ludlum, Autocar.

Willys-Overland Stockholders to Meet

TOLEDO, May 5—The regular annual meeting of the stockholders of the Willys-Overland Co. will be held at the factory offices of the company here May 13 at 2 o'clock. Directors for the ensuing year will be elected.

National Wire Wheel President Dies

GENEVA, N. Y., May 5—Wallace W. Page, president of the National Wire Wheel Works and secretary of the Geneva Cutlery Corp., died last week of pneumonia.

William Hyslop, president of Hyslop Brothers, Toronto, Can., died at his Toronto home on April 26. The concern of which he was head is one of the largest jobbers of automotive equipment in Canada and Cadillac distributor for eastern Canada.

Ford Assembly to Be Done at Plant

DETROIT, May 3—The Ford Motor Co. will hereafter assemble its cars for Michigan at the plant instead of at the factory branch, which was sold last week to a local real-estate company for approximately \$1,500,000. Plant assembly will not take place until after Nov. 1, on which date the company turns over its 10-story branch building to new owners.

The Ford company will this fall build an assembly plant at the factory. Just across Woodward Avenue from the Ford plant, a sales and service station will also be built to handle the commercial work now being cared for at the factory branch. The company decided to discontinue assembly work at the branch when it was apparent that the cost of transporting parts from the factory to the branch by truck was becoming excessive. This work can be handled at the factory at a greatly reduced cost.

The Ford company is now running 3,000 cars daily. Approximately 300 cars a day are assembled at the factory branch for the Michigan trade. On April 8, the company completed Model T engine No. 3,000,000. The first Model T engine was cast in 1908 and has been changed but little since that time. There are now approximately 3,150,000 Ford engines in operation.

Standard Aircraft Liquidating

ELIZABETH, N. J., May 2—The Standard Aircraft Corp. is winding up its affairs preparatory to going out of business. It does not feel that commercial aircraft is getting sufficient support at this time to warrant its continuation. The parent organization commenced work in 1914 and the present company was organized in 1915 to manufacture aircraft exclusively, and was active all through the war.

Badger Aluminum Ready for Production

SHEBOYGAN, WIS., May 2—The Badger Aluminum Co., incorporated early in April with an authorized capital of \$50,000, decided to double this amount, making it \$100,000, at the stockholders' meeting for permanent organization. Equipment and machinery is now being installed in the new plant and the company hopes to be ready to start regular production of castings and stampings by June 15. Officers were elected as follows: President, William A. Erdmann; vice-president, Noah Saemann; secretary, William F. Toepel; treasurer, Charles Voigt; director, William Markwardt.

Marlin-Rockwell Motor Radiators Back to New Haven

NEW HAVEN, May 3—The Motor Radiator Division, formerly the Mayo Radiator Division of the Marlin-Rockwell Corp., which was located temporarily in New York for war work, will shortly be moved back to the plant here. During the war this division manufactured airplane radiators for the Government.

**Current News of
Factories****Notes of New Plants—
Old Ones Enlarged****First Antigo Tractor for Demonstration**

ANTIGO, WIS., May 2—The first demonstrating model of the new four-wheel drive tractor which the Antigo Tractor Syndicate is preparing to manufacture in quantities was completed at the shops of the Dauber-Kratsch Machine Co., Oshkosh, Wis. The design is by D. S. Stewart. Mr. Stewart assisted in the founding of the Topp-Stewart Tractor Co., Clintonville, Wis., from which he retired two and a half years ago.

His latest design weighs 3500 lb. It uses a 32 hp. Doman engine and Hayes front and rear axles. The tractor, although 136 in. long overall, turns within a 16-ft. circle.

Klumb Engine Now Liberty Tractor

SHEBOYGAN, WIS., May 3—The Klumb Engine & Machine Co., an old-established gas engine and farm machinery manufacturing concern, has been reorganized under the laws of Iowa as the Liberty Tractor Co., and is now moving its equipment and offices to Dubuque. Paul Klumb, president and manager of the Sheboygan company, will continue to be associated with the company. At Dubuque a new plant is being erected. The first structure, a machine shop, 80 x 180, is ready for occupancy. An assembling floor and gas engine shop, 60 x 300 and 100 x 250 respectively, will be built during the summer. Practically the entire output until Jan. 1 has been contracted for.

**Aircraft Factory Converted for Car
Manufacture**

WASHINGTON, May 2—Straker & Squire, Ltd., British car manufacturers, have purchased from the Government the national aircraft engine factory at Edmonton, proposing to transfer all its manufacturing industries there, according to a report from Commercial Attaché Kennedy at London. The purchasers intend to concentrate on two standard models—a 6-cylinder passenger car and a 4-cylinder commercial chassis suitable for transport services and omnibuses.

The cars will be British-built throughout and fitted with British magnetos. The entire factory will be organized on the lines of quantity production from standard jigs, and it is anticipated that 5000 workers will be employed continuously. It is planned to produce 2000 complete vehicles in the converted factory in the first year. The price paid the Government for the factory was \$681,300. The Disposal Board has 14 other national factories available for private enterprise.

Ricardo Tank Engine Developments

LONDON, April 15—Developments of the cross-head type of engine invented by Harry R. Ricardo, whose engine was used in the British tanks, is continuing along broader lines. The present development includes a 4-cylinder engine for heavy trucks, with cylinder 4¼ x 6, and a crankshaft speed of 1500 r.p.m. This engine has been developing 72 b.-hp. in tests and is a development of the tank engines in that the valve gear is entirely enclosed. Another development is a heavy duty kerosene engine for tractors intended to develop 30 b.-hp. at 800 to 900 r.p.m. Mr. Ricardo has been accomplishing results with the use of kerosene in the cross-head piston engine. He uses cooled exhaust gas in his patented carbureter and is getting a higher horsepower than with gasoline.

**American Motors Corp. Increases
Capital \$500,000**

NEW YORK, May 2—In order to increase the output of its plant at Plainfield, N. J., the American Motors Corp. has made a stock issue of \$500,000. The output for May is scheduled at 150 cars, June 200, and July and thereafter, 250 per month. At the directors' meeting, P. W. Hansl was elected vice-president and supervisor of sales. He has been secretary and treasurer of the company for years. George G. Gates succeeds him as secretary. G. A. Brower, president of the Penn-American Motor Car Co., Philadelphia, was elected a director. George W. Craven continues as a director, and Laurence P. Rife, for many years production manager of the Hudson Motor Car Co., who has been factory manager since March 1, is also a director of the corporation. Robert Bursner remains president and Louis Chevrolet first vice-president.

Steel Spring Piston Ring Organized

NEW YORK, May 3—The Steel Spring Piston Ring Co. has been formed by A. J. H. Kuhsiek, formerly factory superintendent of Edward V. Hartford, Inc., and A. Meyer, formerly production manager of the same concern, to make the Bull Dog ring, a three piece ring having several novel sales points.

Derf Factory Moved

NEW YORK, May 2—The Derf Mfg. Co. has moved to new factory quarters at 9-13 Walker Street, where both equipment and number of employees have been increased. The company's office remains at 90 West Broadway.

New Chicago Office for Van Dorn Tool

CLEVELAND, May 2—The new Chicago office of the Van Dorn Electric Tool Co. has been opened at 527 South Dearborn Street and extends to 528 Plymouth. William Cottrell remains as sales manager of the Chicago branch.

New York Exports Drop During March

**Cars Increase in Number, but
Value Is Lower—Trucks Show
Big Fall—Parts Also
Show Loss**

NEW YORK, May 3—Although our exports of automotive products through this port show a falling off when compared with those of February, they are well in front of January's totals. Taking the values of cars, trucks and parts for the three months, the following results are arrived at:

January	\$4,274,827
February	6,870,057
March	4,677,369

It is not always a fair method of comparison to take any one month against another. This method does not necessarily indicate either a gain or a falling off in the sense that the actual shipments are limited by the tonnage available for the various ports. For this reason it should not be assumed that because our exports during March are below those of February, our foreign trade is falling off.

The shipping shortage is still severe and there are many thousands of dollars worth of automotive products awaiting overseas transportation.

Enemy Trading Lists Withdrawn

WASHINGTON, May 6—All enemy trading lists issued by the War Trade Board have been withdrawn by it with the authority of the Associated Governments, at the same time all restrictions attached to trading or communication with persons in such lists have been removed. Subject to other rules of the War Trade Board, limitations of trade and communication with persons outside the United States, with whom trade was prohibited by the Trading with the Enemy Act, have also been withdrawn. This action does not, however, affect any of the restrictions against trade with Germany or Hungary, nor does it authorize trade with any person or company taken over by the Alien Property Custodian. The Associated Governments have reserved the right to re-issue the Enemy Trading List if found necessary.

Want Two-thirds Canadian Products Permitted to Enter England

WINDSOR, ONT., May 3—Automobile manufacturers of the border cities, comprising Ford, Walkerville, Sandwich, Windsor and Ojibway, favor a compromise in British tariff regulations that will permit Canadian products, provided they are 66 2/3 per cent of Canadian manufacture, to enter the British Isles.

A number of Canadian car factories are subsidiaries of United States concerns, and are utilized largely for assembling purposes, although recent activities indicate that in future more

Automobile, Truck and Parts Exports from New York for February

	Cars		Trucks		Parts
	No.	Value	No.	Value	Value
Argentina	206	\$233,005	7	\$9,675	\$209,368
Australia	179	197,929	35	39,040	63,064
Barbadoes .....	..	..	3	2,856	2,305
Belgium	5	4,060	..	..	22,852
Bolivia .....	..	..	..	..	2,365
Brazil	93	90,692	17	9,370	53,819
British East Africa	1	2,091	..	..	1,898
British East Indies .....	..	..	..	..	108
British Guiana	2	2,500	2	1,901	5,039
British India	39	42,329	..	..	20,375
British South Africa	93	109,653	3	6,142	74,989
British West Africa	29	27,718	6	7,692	21,482
British West Indies	2	1,040	6	3,600	2,113
Canary Islands .....	..	..	..	..	20
Chile	112	100,005	32	25,634	69,979
China	36	43,078	50	86,647	15,386
Colombia	26	19,235	2	1,000	4,267
Costa Rica .....	..	..	..	..	16
Cuba	77	60,542	40	66,524	80,630
Danish West Indies	4	1,940	..	..	309
Denmark	15	30,184	26	25,475	7,332
Dutch East Indies	92	192,206	39	73,891	64,941
Dutch Guiana .....	..	..	..	..	1,249
Dutch West Indies .....	..	..	..	..	726
Ecuador .....	..	..	..	..	612
England	35	43,835	11	21,347	281,650
France	71	169,693	130	568,125	131,309
French Africa	10	4,392	7	6,710	2,199
French East Indies	6	5,734	..	..	..
French West Indies	12	9,051	6	6,016	3,408
French Guiana .....	..	..	..	..	18
Greece	10	12,798	1	972	4,737
Guatemala .....	..	..	..	..	594
Haiti .....	..	..	..	..	1,809
Honduras .....	..	..	..	..	134
Hongkong	9	11,385	..	..	3,398
Iceland	2	1,271	..	..	988
Italy .....	..	..	..	..	10,798
Jamaica	7	6,311	3	1,650	6,838
Japan	181	112,450	18	30,434	15,970
Japanese China .....	..	..	3	5,000	682
Mexico	42	38,393	3	10,735	10,881
Morocco	2	3,100	..	..	..
Netherlands .....	..	..	..	..	7,435
Newfoundland	2	2,500	..	..	589
New Zealand	65	84,550	2	8,577	4,469
Nicaragua	8	4,689	3	1,511	1,672
Norway	21	50,383	25	63,326	37,398
Panama	16	10,765	..	..	1,191
Peru	8	14,850	..	..	3,536
Philippine Islands .....	..	..	5	13,200	285
Russia in Asia	3	1,900	..	..	98
Salvador	2	2,984	..	..	75
Santo Domingo	19	15,631	6	3,300	6,973
Scotland .....	..	..	..	..	1,002
Serbia .....	..	..	1	3,000	..
Siam	9	9,390	3	1,613	547
Spain	60	92,453	10	13,520	21,528
Sweden	30	63,380	..	..	1,849
Straits Settlements	60	73,197	6	9,000	15,890
Trinidad	1	875	..	..	2,043
Turkey in Asia .....	..	..	..	..	2,489
Turkey in Europe	1	4,000	..	..	..
Uruguay	139	149,495	12	12,000	55,502
Venezuela	22	15,263	7	4,000	3,578
	1,864	\$2,164,675	530	\$1,143,488	\$1,369,206

actual manufacturing will be done in the Dominion.

Under present regulations United States cars and parts are not allowed in the British Isles, and well-founded rumors reaching the Border Chamber of Commerce are to the effect that British manufacturers are opposed to admitting even cars from Canada, provided less than 80 per cent construction work is done in this country.

Fords May Be Made in Tokio

DETROIT, May 3—Henry Ford may establish a car and tractor plant in Tokio, Japan, according to Baron Shimpel Goto, one of Japan's most influential men, who is here conferring with Mr. Ford. Mr. Ford is now contemplating a trip to the Far East, the Baron said. The Japanese nobleman is making a study of American manufacturing methods.

Continental Motors Dividend

Continental Motors Corp., Detroit, 1 1/2 per cent dividend payable May 15 to stockholders of record May 10.

\$6,000,000 Canadian Plant for General Motors Started

WALKERVILLE, ONT., May 5—Ground has been broken for the \$6,000,000 plant of the General Motors Corp. here. Plans call for the erection of two structures, 300 x 200 ft. Within 2 weeks more than 300 men will be employed in construction work, it was stated, preference being given to returned Canadian soldiers.

Goodyear Opens Office in Spain

AKRON, May 5—The Goodyear Tire & Rubber Co. has established a branch at Madrid, Spain, with Edward M. Sonntag in charge.

Scripps-Booth Up to 45 Cars Daily

DETROIT, May 2—The Scripps-Booth Corp. will be housed in its new \$1,500,000 factory this fall. While the plant is in construction production of the present plant will not be affected. The company is turning out 45 cars daily, while the demand calls for 50 per cent more than can be produced. It is exporting 150 cars monthly.

Government Disposes of 605,235 Tons Iron and Steel

WASHINGTON, May 5—The government is about to dispose of a total of 605,235 tons of iron and steel, including 47,908 net tons of raw materials, 514,460 net tons of finished steel and semi-finished products, 2,150 net tons of cast iron and steel, and 31,317 tons of scrap. The material will be disposed of on sealed bids to be accompanied by a certified check for 20 per cent of the amount of the bid, deliveries to be made f.o.b. cars.

Completing Government Aviation Engines

WASHINGTON, May 5—All orders for aviation engines for the army have been completed except those on Hispano-Suizas, and for the week ended April 17 only 1058 of these remained to be delivered. Of these 809 are the 180-hp. type and 249 are the 300-hp. type. The original order was for 6000 of the former and 500 of the latter. Deliveries of DeHaviland 4 planes are 99.9 per cent complete, 4,842 of 4,846 having been turned over.

War Department Sells Lead

WASHINGTON, May 3—Surplus stocks of lead owned by the War Department are being sold at current local

market prices in the community in which the surplus is held. It is scattered throughout the country and there is no large quantity in any one place. The department has 7000 tons of lead on hand, a small percentage of the year's production, and not sufficient to affect the market.

American Welding Bureau Officers Elected

NEW YORK, May 5—At a meeting of the American Bureau of Welding at the Engineering Societies Building, by-laws were adopted and the following officers elected: Director, C. A. Adams; vice-directors, H. M. Hobart and A. S. Kinsey; treasurer, W. E. Symons; secretary, H. C. Forbes. At a directors' meeting J. H. Deppeler of the Metal & Thermit Corp., Jersey City, was elected a director of the society.

Regular meetings of the Bureau are to be held the third Friday of each month. It was also voted that a Research Committee be established to carry out the plan of co-operation in conducting investigations.

Hackett Car Plant Nearing Completion

GRAND RAPIDS, MICH., May 5—Work is nearing completion on the new plant of the Hackett Motor Car Co. This company recently moved here from Jackson.

Purchasing Agents Want Standard Invoice Forms

DETROIT, May 3—The Standardization Committee of the National Assn. of Purchasing Agents is making a thorough effort to standardize the forms used for bill heads or invoices. The members complain very strongly about the lack of standardization. They desire to have the date, invoice number and other information in some predetermined spot on the page and want the sheets of a uniform size for convenience in filing and handling.

The committee has outlined the following points, which should be borne in mind when considering this subject:

1. In order to have a standard form enthusiastically adopted by the selling organizations it should appeal to them as reasonable.

2. No attempt should be made to force anything through which will serve as a restraint upon business and therefore we should aim to make our form fit the requirements of the selling as well as the buying end of business.

3. Large selling organizations are now using accounting machinery, such as electrical tabulating equipment for statistical purposes, and any form must be large enough to permit ready use of these accounting machines without interfering with the accuracy of the work.

4. To accommodate these accounting machines it is necessary to have definite columns provided in which to show description, size, quantity, dimensions, weight, price each, total price, and a separate column for the net total of the invoice. To this must be added some other columns in many cases to suit certain lines of business, such as number of bundles, number of feet, length, etc.

5. From the standpoint of the purchasing agent particularly, and the sales department secondly, it is desirable to have the date, order number, invoice number, car number, and similar data placed in some definite spot on each and every invoice so that there is always one place to look for this information.

6. Some of the information in No. 5 should be so located on the sheet that it will be convenient when looking through a file for a definite invoice.

7. It may be necessary to provide more than one length of invoice form, but if it is possible to do so that should be avoided. One standard size would be far preferable from the standpoint of filing. This also has some advantages in the use of accounting machinery.

The subject is to be discussed at meetings of the various branch associations throughout the country. The National Assn. of Purchasing Agents has made great strides toward the standardization of catalogs, and hopes to meet with similar co-operation in eliminating the confusion which now surrounds the matter of invoices. The members of its Standardization Committee are:

W. V. C. Bulkeley, Liberty Steel Products Co., New York City.
H. H. Meehan, A. B. Dick Co., Chicago.
A. Lockwood, Lumen Bearing Co., Buffalo.
K. L. Kulow, Willard Storage Battery Co., Cleveland.
W. L. Chandler, Dodge Sales & Engineering Co., Mishawaka, Ind.

Standard Parts Dividend

Standard Parts Co., Cleveland, 1½ per cent, common, payable May 15 to stockholders of record May 6.

Exports of Automotive Equipment for March and Eight Previous Months

	1918		1919		1918		1919	
	No.	Value	No.	Value	No.	Value	No.	Value
Airplanes .....	.....	.....	.....	.....	18	\$192,620	43	\$577,600
Airplane parts .....	.....	\$1,219,743	.....	\$639,858	.....	5,959,990	.....	10,133,099
Commercial cars.....	626	1,537,949	1,223	3,124,484	9,855	26,505,174	8,934	24,407,841
Motorcycles.....	1,105	256,997	7,198	327,609	7,928	1,739,567	6,737	1,636,242
Passenger cars.....	4,249	3,981,016	3,443	4,168,184	41,879	35,653,258	22,966	26,502,156
Parts, not including engines and tires .....	.....	2,683,902	.....	2,527,620	.....	23,982,557	.....	24,978,768
Totals.....	5,980	\$9,679,607	5,864	\$10,787,755	59,680	\$94,033,166	38,680	\$88,235,711

	1918		1919		1918		1919	
	No.	Value	No.	Value	No.	Value	No.	Value
Automobile, gas ..	3,219	\$394,496	1,445	\$244,044	28,515	\$3,280,221	17,200	\$2,717,070
Marine, gas	520	263,958	1,119	552,055	5,751	1,904,216	4,889	2,652,941
Stationary, gas ..	2,873	331,157	1,623	257,579	19,241	2,216,176	16,777	2,470,616
Tractor, gas	3,900	3,651,020	943	994,737	15,751	15,808,038	15,511	17,164,673
Totals.....	10,512	\$4,640,631	5,130	\$2,048,415	69,258	\$23,208,651	54,377	\$25,005,300

Exports by Countries for March, 1919—Eight Months Ending March, 1919

	Cars		Trucks		Cars		Trucks	
	No.	Value	No.	Value	No.	Value	No.	Value
Denmark	15	\$30,184	.....	.....	158	\$262,728	.....	.....
France	73	170,893	166	\$764,125	678	911,787	3,105	\$13,035,669
Norway	21	50,383	.....	.....	234	477,523	.....	.....
Russia in Europe ..	62	94,053	.....	.....	6	6,805	.....	.....
Spain .....	.....	.....	.....	.....	566	760,538	.....	.....
United Kingdom ..	35	43,835	11	21,347	131	186,568	869	2,531,039
Canada	405	430,102	401	1,352,690	2,389	2,267,137	1,488	2,776,611
Mexico	199	178,922	.....	.....	1,335	1,340,006	.....	.....
Cuba	151	171,431	61	103,121	1,326	1,955,579	456	888,636
Argentina	206	223,005	7	9,675	1,210	1,503,439	49	96,363
Chile	116	109,289	.....	.....	926	1,411,236	.....	.....
Uruguay	139	149,495	.....	.....	626	603,495	.....	.....
British India	39	42,329	.....	.....	111	144,498	.....	.....
Dutch East Indies ..	158	282,380	.....	.....	1,387	1,831,734	.....	.....
Russia in Asia.....	3	1,900	.....	.....	6	13,634	15	18,200
Australia	212	242,047	.....	.....	2,595	2,464,407	.....	.....
New Zealand	65	84,550	.....	.....	998	996,952	.....	.....
Philippine Islands ..	156	223,288	.....	.....	1,046	1,176,815	.....	.....
British So. Africa ..	93	109,683	.....	.....	903	944,731	.....	.....
Other countries.....	1,295	1,530,415	577	873,526	6,335	7,242,744	2,952	5,061,328
Totals	3,443	\$4,168,184	1,223	\$3,124,484	22,966	\$26,502,156	8,934	\$24,407,846

Oil Exports for March and 9 Months Ended March, 1919

	March, 1919		March, 1918		9 months ended March, 1919		9 months ended March, 1918	
	Gallons	Value	Gallons	Value	Gallons	Value	Gallons	Value
Crude mineral oil.....	9,172,572	\$549,812	8,787,165	\$576,639	33,978,978	\$8,398,658	127,840,914	\$6,144,833
Illuminating oil	54,280,902	6,537,000	49,048,642	4,943,369	425,515,688	46,661,851	411,424,127	36,120,277
Lubricating oil	21,244,331	6,154,923	25,755,958	7,324,550	201,554,178	64,370,953	203,881,418	48,319,537
Gasoline, naphtha, etc.....	22,402,072	5,577,230	46,885,000	12,152,117	382,835,156	95,052,217	319,309,081	77,241,263
Residuum, fuel oil, etc.....	36,940,670	2,031,946	80,473,120	4,103,169	755,229,304	42,778,694	922,806,472	45,207,427

AUTOMOTIVE MATERIALS MARKETS

Materials Market Prices

Acids:

Muriatic, lb. ⁹	.02 - .03
Phosphoric (85%) lb.	.35 - .39
Sulphuric (60%), lb.	.008

Aluminum:

Ingot, lb.	.29 - .31
Sheets (18 gage or more), lb.	.42

Antimony, lb. .07 - .07½

Burlap:

8 oz., yd.	.08½ - .08¾
10½ oz., yd.	.10½

Copper:

Elec., lb.	.15¼ - .15½
Lake, lb.	.15¼ - .15½

Fabric, Tire (17¼ oz.):

Sea Is., combed, sq. yd.	1.00
Egypt, combed, sq. yd.	1.25
Egypt, carded, sq. yd.	1.20
Peelers, combed, sq. yd.	1.08
Peelers, carded, sq. yd.	.85

Fibre (¾ in. sheet
base), lb. .50

Graphite:

Ceylon, lb.	.09 - .22
Madagascar, lb.	.10 - .15
Mexico, lb.	.03¾

Lead, lb. .04¾ - .05

Leather:

Hides, lb.	.24 - .42½
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Nickel, lb. .40

Oil:

Petroleum (crude):	
Kansas, bbl.	2.25
Pennsy., bbl.	4.00
Gasoline:	
Auto, gal.	.24½
68 to 70 gal.	.30½
Lard:	
Prime City, gal.	2.60 - 2.65
Ex. No. 1, gal.	1.00 - 1.20
Linseed, gal.	1.53 - 1.56
Menhaden (dark), gal.	.85 - .90

Rubber:

Plantation:

First latex pale crepe, lb.	.46½
Brown crepe, thin, clear, lb.	.44½
Smoked, ribbed sheets, lb.	.46

Para:

Up River, fine, lb.	.56
Up River, coarse, lb.	.34
Island, fine, lb.	.47½ - .48

Shellac (orange), lb. .56 - .57

Spelter, lb. .06 - .06¼

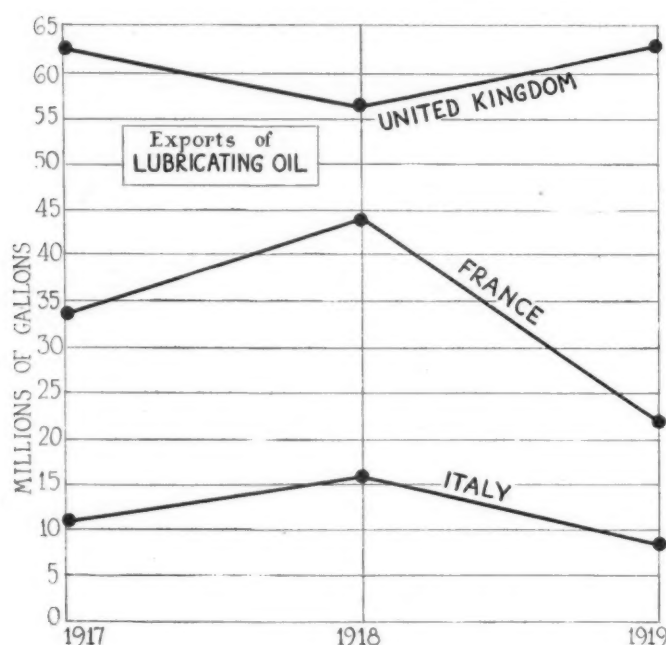
Steel:

Angle beams and channels, lb.	.03
Automobile sheet (see sp. table).	
Cold rolled, lb.	.0625
Hot rolled, lb.	.039

Tin .72½

Tungsten, lb. 1.00

Waste (cotton), lb. .12¾ - .17



Exports of fuel oil to the United Kingdom, France and Italy for the seven months ended January 31, 1919. The figures indicate the enormous quantity needed for the operation of oil-burners in the British fleet

AUTOMOBILE SHEET PRICES

(Based on No. 22 Gage. Other gages at usual differentials)

	Primes only per 100 lbs.	Primes when Seconds up to 15 per cent are taken per 100 lbs.
Automobile body stock.....	\$5.95	\$5.85
Automobile body stock, deep stamping	6.20	6.10
Automobile body stock, extra deep stamping	6.45	6.35
Hood, flat, fender, door and apron, or splash guard stock.....	6.05	5.95
Crown fender, cowl and radiator cas- ing, extra deep stamping.....	6.55	6.45
Crown fender, cowl and radiator cas- ing, deep stamping.....	6.30	6.20
Automobile Sheet Extras for Extreme Widths:		
Nos. 17 and 18 over 36 in. to 44 in., 10c. per 100 lbs.		
Nos. 19 and 21 over 36 in. to 44 in., 30c. per 100 lbs.		
Nos. 22 to 24 over 26 in. to 40 in., 40c. per 100 lbs.		
Nos. 22 to 24 over 40 in. to 44 in., 80c. per 100 lbs.		
Blank Sheet Extras to Apply to Narrow Widths:		
Oiling, 10c. per 100 lb.		
Patent leveling, 25c. per 100 lb.		
Resquaring, 5 per cent of gage price after quality, finish and size extras have been added.		
Seconds 10 per cent less than the invoice Pittsburgh price for corresponding primes.		

Automotive Securities on the Chicago Exchange at Close of May 3

	Bid	Asked	Net Ch'ge		Bid	Asked	Net Ch'ge		Bid	Asked	Net Ch'ge
Auto Body Company.....	9	10	..	Motor Products Corp.....	35	..	..	Ajax Rubber Co.....	92½	94½	+2½
Briscoe Motor Car com....	14	..	..	Nash Motors Co. com....	230	..	..	Firestone T. & R. com....	142	145	+2
Briscoe Motor Car pfd....	50	65	..	Nash Motors Co. pfd....	95	100	..	Firestone T. & R. pfd....	100	101	..
*Chandler Motor Car.....	144	146	+2	National Motor Co.....	16	20	..	Fisk Rubber Co. com....	135	140	..
Chevrolet Motor Car.....	209	211	..	Packard Motor Car com....	146	149	..	Fisk Rubber 1st pfd....	100	105	..
Cole Motor Car Co.....	93	105	..	Packard Motor Car pfd....	99	102	..	Fisk Rubber 2nd pfd....	138	142	..
Continental Motors com....	9¼	9½	+½	Paige-Detroit Motor com.	34½	35½	..	Fisk Rubber 1st pfd.conv.	105	110	..
Continental Motors pfd....	96	99	..	Paige-Detroit Motor pfd....	9	9¾	..	Goodrich, B. F. com....	73¼	74¼	+2¼
Edmunds & Jones com....	19	22	+4	Peerless Motor Truck....	26	28	-1	Goodrich, B. F. pfd....	107	109	..
Edmunds & Jones pfd....	72	78	-3	*Pierce-Arrow M. Car com.	51¾	52¾	+½	Goodyear T. & R. com....	284	288	+4
Electric Storage Bat.....	75	77	..	Pierce-Arrow M. Car pfd.	102	104	..	Goodyear T. & R. 1st pfd.	105½	107½	..
Federal Motor Truck.....	34	37	..	Premier Motor Corp. com.	5	..	..	*Goodyear T. & R. 2nd pfd.	106	107½	..
Fisher Body Co. com....	57½	58½	-1½	Premier Motor Corp. pfd.	..	75	..	*Kelly Springfield com....	126½	127½	+3%
Fisher Body Co. pfd....	92	94	..	Fruden Wheel Company..	21	22	..	Kelly Springfield 1st pfd.	95	97	..
Ford Motor of Canada.....	320	330	..	Reo Motor Car Co.....	26¾	27½	+¼	Lee Tire & Rubber Co....	36¾	37¾	+4%
General Motors com....	181¾	182¾	+1½	*Republic M. Truck com..	43	45	-½	Marathon Tire & Rubber..	55	75	+2
General Motors pfd....	89½	91½	-1½	Republic M. Truck pfd....	91	95	..	Miller Rubber Co. com....	172	175	+2
Hupp Motor Car com....	9¼	9¾	+¾	Saxon Motor Car pfd....	6½	8½	-¾	Miller Rubber Co. pfd....	104	..	+2
Hupp Motor Car pfd....	98	101	+2	Scripps-Booth Corp.....	21	25	..	Rubber Products Co.....	127	130	+2
Kelsey Wheel Co. com....	35	37	..	Studebaker Corp. com....	76¾	77¾	+1¾	Portage Rubber Co. com.	155	159	-3
Kelsey Wheel Co. pfd....	93	95	..	Studebaker Corp. pfd....	94	97	..	Swinehart T. & R. Co....	78	81	+1
Manhattan Electric S. com.	..	48	..	Stutz Motor Car Co.....	57½	58½	+1½	U. S. Rubber Co. com....	98¼	99¼	+11¼
Maxwell Motor com....	40¾	41¾	+1¼	United Motors Corp.....	47	49	..	*U. S. Rubber Co. pfd....	112	113	+¾
Maxwell Motor 1st pfd....	68½	69½	-½	White Motor Co.....	62½	63½	+4¾				
Maxwell Motor 2nd pfd....	31¼	32¼	-¼	Willys-Overland com....	34	35	+2				
McCord Mfg. com....	34	37	..	Willys-Overland pfd....	92	93	..				
McCord Mfg. pfd....	97	100	+2								
Mitchell Motor Co.....	38	41	+5								

*Ex dividend.

A Plan to Stabilize the Dollar
(Continued from page 1006)

authorized to mark the dollar up or down according to his own caprice? Most certainly not. A definite and simple criterion for the required adjustments is at hand—the now familiar “index number” of prices. The Bureau of Labor Statistics, which now publishes an index number, the Bureau of Standards, or other suitable Government office would be required to publish this number at certain stated intervals, say monthly. That is, each month the bureau would calculate from current market prices how much would have to be paid for our composite basket of goods. This figure it would publish and proclaim; and this figure would then afford the needed official sanction to the Secretary of the Treasury to change the rating of the gold dollar—that is, to change the amount of gold which the mint would give or take for a gold certificate, and thus increase or diminish the purchasing power of that certificate. The certificate would always be equal to the gold dollar; and the gold dollar would be kept equal to the goods-dollar, which is the ultimate standard. If, for instance, the index number representing the current price of our composite basket of goods is found to be 1 per cent above the ideal par—that is, above the one dollar price it had at first—this fact will indicate that the purchasing power of the dollar has gone down; and this fact will be the signal and authorization for an increase of 1 per cent in the weight of the gold dollar. For what is added to the weight of the gold dollar will be automatically registered in the purchasing power of its circulating certificate.

Summary of Plan

The plan, then, as above set forth, is, in brief:

(1) To abolish gold coins and to convert our present gold certificates into “gold-dollar certificates” entitling the holder to dollars of gold bullion of such weight as may be officially declared from time to time.

(2) To retain the virtual “free coinage”—that is, deposit—of gold and the free redemption of gold-dollar certificates.

(3) To designate an ideal composite goods-dollar consisting of a representative assortment of commodities, worth a dollar at the outset, and to establish an index number for recording, at stated intervals, the market price of this composite dollar in terms of the gold dollar.

(4) To adjust the weight of the gold-bullion dollar at stated intervals, each adjustment to be proportioned to the recorded deviation of the index number from par.

(5) To impose a small “brassage” fee not to exceed any one change in the gold dollar's weight.

The crux of the plan lies in the steering rule by which the index number regulates the dollar's weight. Its significance is that to keep the gold dollar from shrinking in value we make it grow in

weight, thus recognizing that a depreciated dollar is a short-weight dollar; and reversely, to keep the dollar from growing in value we make it shrink in weight, thus recognizing that an appreciated dollar is an overweight dollar.

Or again, since a heavier or lighter dollar simply means a lower or raised price of gold, we may say that to keep the level of prices of other things from rising or falling we make the price of gold itself fall or rise.

Italian Market for Automobiles

WASHINGTON, May 3—There is a great demand for a lightweight low-priced car in Italy, according to Trade Commissioner M. J. Chisea at Rome. The demand is greatest in the rural districts throughout the provinces, where the people increased their resources during the war. For instance, in Macerata with a population of 20,000, there are 500 cars in use. The car most suitable is one for general use, simple in construction, lightweight and selling at \$600 to \$1000 delivered.

American manufacturers of the lower priced cars would do well to survey this field and prepare for future possibilities. The market is almost a virgin one, and no particular make of car predominates. Most of the Italian cars now available are too high priced, and the majority of the people are postponing purchases until prices are lower. There is a lack at this time of standardization in the industry, which is also handicapped by the shortage of raw materials and the increasing labor costs.

As the restrictions placed by the Italian government prevent the importation of automobiles into Italy, manufacturers will necessarily have to limit their activities to organization. Publicity at this time would be advantageous, with actual demonstration a little later on. American manufacturers should be ready for this trade when importation restrictions have been lifted.

Missouri's Compensation Law

ST. LOUIS, May 3—Missouri now has a workmen's compensation law, of which some of the provisions are:

Basis of compensation—Two-thirds of the average wage; not to exceed \$15, nor less than \$6 a week.

Effective Nov. 1, although commissioners are to be appointed at once and immediately organize.

Employers are permitted to carry their insurance in private companies.

Employers and employees presume to be operating under the act, but they may elect whether to come under its provisions.

Commission to be bi-partisan, and one member will represent the employers and another the employees.

Medical aid first 8 weeks will not exceed \$200, employer choosing the physician, but the employee has the privilege to choose a physician at his own expense.

Temporary total disability will not exceed 400 weeks, and temporary partial disability, two thirds of the wage loss, not exceeding 200 weeks.

Pension of permanent total disability is two-thirds wages for 240 weeks and thereafter 40 per cent of wages for life.

Death burial benefit of \$100 in every case; total dependents to receive two-thirds of wages for 300 weeks.

Exempts agricultural and domestic pursuits of less than five employees.

Fuel Limitations of Tractor Engines
(Continued from page 1003)

In nearly all so-called good oils there is a portion in the medium content which constitutes the very essence of good lubricating qualities. This constitutes about 15 per cent of lubrication oils, and it would be impossible to supply the demands if this were the only oil accepted by the user. Oil companies virtually have to fill in with lighter oils to give a flow and heavy oils to give body and viscosity at the higher temperatures.

Light oils and even medium body oils evaporate at low temperatures and are thus the cause of excessive oil consumption. Heavy oils having complex molecules break down under high temperatures. Light oils have no body or viscosity at high heat. In rough terms, therefore, the oil which comes off at medium temperatures will not evaporate excessively at high temperatures, nor disintegrate. In aviation oil, a maximum of the good medium is used. In compounding a tractor oil a little of the lighter and heavier is used with the good, and so on through the truck oils down to the oils for small passenger-car engines, where, because of the low temperatures, a maximum of the light fair quantity of the good and a minimum of the heavy can be used.

Vaporizing and atomizing defects of our present systems are our design faults affecting starting. The high boiling point of the first drop of fuel coming off at distillation tests in our gasolines is the characteristic in the modern fuels affecting starting. Because so little of the fuel can be vaporized at the intake manifold temperatures, large volumes of fuel beyond what would be necessary in an easily vaporized fuel are taken in. Motors start with difficulty at that, and all this amounts to inconvenience and bad blood between the user and modern engines.

Whatever inconvenience arises is nothing compared to the damage done to the combustion chamber with heavy fuel and the lubricating oil by dilution when the engine is cold in starting. Perhaps 70 per cent of these troubles comes from this source at the time of starting. Means for catching the heavy oil and preventing it from entering the combustion chamber must be provided.

Massachusetts Fighting Motor Legislation

BOSTON, May 3—Massachusetts motorists and dealers are up in arms over three bills that are now being threshed out by the legislature. One bill calls for tripling the fees on motor vehicles, put in by Mayor Peters of Boston. A second bill would require every motorist to be bonded before being allowed on the roads. A similar measure was killed last year and the year before. A third bill seeks to have dealers make a record every day of the cars they take in trade, and send the report to the State House to the Highway Commission and also to the local police. The used car dealers would have to hold their cars four days; the new car dealers could sell theirs by getting a permit.

Calendar

SHOWS

- May 10-17—Bristol, Va.-Tenn. Cars, Trucks, Tractors, Airplanes and Accessories. Bristol Chamber of Commerce. C. W. Roberts, Manager.
- May 15-June 1—Venezuela. National Exhibit of Venezuela.
- June 2-6—Hot Springs, Va. Convention Automotive Equipment Assn., Homestead Hotel.
- *Oct. 15—Paris. Grand Palais, International Automobile Mfrs. Congress.
- Nov. 7-15—London. Olympia Motor Car Exhibition—Society of Motor Mfrs. and Trades.
- December—Brussels. International Automobile Mfrs. Congress.
- January—New York. International Automobile Mfrs. Congress.
- February—Chicago. International Automobile Mfrs. Congress.
- Feb. 23-Mar. 6—Birmingham, Eng. British Industries Fair.

TRACTOR SHOWS

- May 6-12—Sacramento, Cal.—Sectional Tractor Demonstrations, Demonstration Field.
- May 30—College Park, Md.—Power cultivator Demonstration, Maryland State Dept. of Agriculture.
- June 8-14—Denver, Col. Sectional Tractor Demonstrations, Denver Tractor Club.
- July 14—Wichita, Kan. Automotive Committee of National Implement Assn.
- Aug. 18-22—Aberdeen, S. D. Sectional Tractor Demonstrations.
- October—Ottawa, Ont., Can. Interprovincial Plowing Match and Tractor Demonstration.

CONTESTS

- †May 17—Uniontown, Pa., probably 112½ miles.
- May 30—Atlantic City, N. J.—Airplane races—Aeronautic Convention.
- May 30-31—Richmond, Va.—2-Day Dirt Track Meet. Virginia State Fair Grounds Track.

May 30-31—Los Angeles, Cal.—Los Angeles-Yosemite 3rd annual gasoline economy run.

†May 31—Indianapolis, Indianapolis Motor Speedway Assn., 500 miles.

*June 14—Sheepshead Bay, L. I. Speedway race.

July 4—Atlantic City, N. J.—Airplane races—Aeronautic Convention.

*July 5—Cincinnati, O., Speedway.

*July 19—Uniontown, Pa. Speedway race.

*July 26—Sheepshead Bay, L. I. Speedway race.

*Aug. 15—Middletown, N. Y. Dirt track event.

*Aug. 22-23—Elgin, Ill. Road race.

*Aug. 23—Sheepshead Bay, L. I. Speedway race.

*Sept. 1—Uniontown, Pa. Speedway race.

*Sept. 20—Sheepshead Bay, L. I. Speedway race.

*Sept. 27—Allentown, Pa. Dirt track event.

*Oct. 1—Cincinnati, O. Speedway race.

†Sanctioned.

*Tentative dates.

*Oct. 4—Trenton, N. J. Dirt track event.

*Oct. 11—Danbury, Conn. Dirt track event.

CONVENTIONS

- May 1-June 1—Atlantic City, N. J.—Pan-American Aeronautic Convention and Exhibition—Aero Club of America, the Aerial League of America and the Pan-American Aeronautic Federation.
- May 21-24—Washington—Conference on Weights and Measures—Bureau of Standards.
- May—Washington, Pan-American Commercial Conference, Pan-American Union Building.
- June 2—Chicago, Ill.—Natl. Gas Engine Assn. Hotel Sherman.
- June 23-28—Ottawa Beach, Mich.—S. A. E. Mid-summer Meeting.
- Sept. 22-24—Philadelphia. Annual Convention. National Association of Purchasing Agents, Bellevue-Stratford.

Foreign Trade Opportunities

WASHINGTON, May 3—The Bureau of Foreign and Domestic Commerce, Department of Commerce, has inquiries for the agencies of automobiles and accessories, airplanes and airplane parts, farm tractors and trucks. Full information regarding each of the following can be had by addressing the Bureau of Foreign and Domestic Commerce at Washington, D. C., and referring to the Foreign Trade Opportunity number.

Tunisia—Tractors of crawler type, in three sizes, 12 to 20 hp., 35 to 45 hp., and 50 to 70 hp., using gasoline or kerosene, preferably kerosene. Correspondence may be in English. No. 29235.

Colombia—Car for 20 passengers; for use in a tropical country. Plans and specifications to purchasing agent here. Name and address bureau or its district offices. No. 29237.

Brazil—An American citizen desires to purchase farm tractors. Payment, cash against documents in New York or at destination. No. 29230.

Norway—Automobiles and supplies. Terms cash against documents in New York or at destination. No. 29168.

Norway—Cars, motorcycles, tires, engines and accessories. Terms, cash against documents. No. 29185.

France—For the sale in France and Morocco of oil, low-priced cars and motorcycles. No. 29188.

Switzerland—Rubber tires and tubes, cheap cars, two and four passenger, and accessories. Purchases in large quantities. No. 29190.

Egypt—Engines, motor plows, motors, lorries and agricultural machinery. No. 29034.

Spain—Gasoline or petroleum tractors from 10 to 30 hp. Four immediately. If satisfactory, ten or twelve later. Correspondence may be in English. No. 29039.

Sweden—Automobile tires. Quotations should be given f.o.b. New York. Terms cash against documents. No. 29059.

American Firm with Connection in Denmark—Trucks, cars, motorcycles, parts and accessories, marine engines, tractors, airplanes, pneumatic and solid tires and tubes, brake lining, tools and machinery for automobile shops and garages. No. 29068.

Spain—Truck tires. Quotations should be f.o.b. New York. Payment cash against documents. Correspondence in Spanish. No. 29079.

France—Low-priced cars. Correspondence in French. No. 29084.

Belgium—All kinds of electrical machinery, fittings and apparatus, internal-combustion engines, motor cars, trucks and lorries. No. 29090.

Ireland—Moderately priced light car, truck, tractor and accessories. No. 29091.

American Buying Agents for Far East—American tractors not too heavy, and fairly low, that may pass under trees on plantations, turn about in their own length, and pull from 1- to 6-disk ploy, plowing 8 in. deep. Information wanted as to the number of acres covered per 8-hr. day, gas consumption per day, etc. One light, one medium tractor, and one lightweight and one medium wheel-driven tractor. No. 29093.

Australia—Automobile accessories. Reference supplied. No. 29107.

Algeria—Lathes, drills, tools, etc., for repair work, cars, trucks and tires. Correspondence should be in French. Reference supplied. No. 29136.

Norway—Second-hand motorcycles, cars and tools. Payment through bank in New York. Reference supplied. No. 29145.

China—Rebuilt cars, motorcycles and engines. No. 20155.

Orders Placed by War Department

WASHINGTON, May 2—The War Department has approved the following orders:

McCord Mfg. Co., Detroit, radiators, \$30-739.46.

Reo Motor Co., Lansing, spare parts, \$30-867.64.

Kelly-Springfield Motor Truck Co., Springfield, O., rear parts, \$34,971.20.

Standard Steel Castings Co., steel wheels, \$72,688.02.

Briscoe Motor Corp., 1 set tools, 5000 differentials, \$1,279.91.

Richmond Forging Co., axles, \$167,538.86.

Lexington Motor Co., 1,000 10-ton trailers, \$74,882.57.

Dort Motor Car Co., crating chassis, \$1,738.17.

Columbia Wagon Co., escort wagons and wheels, \$52,342.94.

Winona Wagon Co., escort wagons and parts, \$63,146.81.

Garford Motor Truck Co., spare parts, \$46,017.62.

Westfield Mfg. Co., Westfield, Mass., spare parts, \$9,431.62.

Locomobile Co., Bridgeport, spare parts, \$417,431.76.

Packard Motor Car Co., Detroit, spare parts, \$379,888.36.

Peerless Motor Car Co., Cleveland, spare parts, \$120,683.48.

Pierce-Arrow Motor Car Co., Buffalo, spare parts, \$298,520.28.

The White Co., Cleveland, spare parts, \$73,204.62.

Buick Motor Co., Flint, Mich., spare parts, \$49,317.32; repair parts, \$24,656.86.

Four Wheel Drive Auto Co., Clintonville, Wis., spare parts, \$168,863.51.

General Motors Truck Co., Pontiac, spare parts, \$32,193.23.

Willard Storage Battery Co., spare parts, \$264,780.33.

Harley-Davidson Motor Co., Milwaukee, spare parts, \$9,270.72.

Continental Motor Corp., Muskegon, Mich., repair parts, \$7,358.96.

Goodyear Tire & Rubber Co., Akron, casings, \$190,871.14; tubes, \$6,824.30; solid pressed on tires, \$29,919.22; demountable solid tires, \$10,851.50.

Firestone Tire & Rubber Co., Akron, casings, \$268,017; tubes, \$85,492.39.

B. F. Goodrich Rubber Co., Akron, casings, \$127,647; tubes, \$9,220.45.

Fisk Tire & Rubber Co., Chicopee Falls, Mass., casings, \$56,991.

For Standard Tractor Ratings

CHICAGO, May 6—It is likely that a standard method of rating farm tractors may be developed by the United States Department of Agriculture, working in conjunction with the Tractor Division of the National Implement & Vehicle Association. The latter body has appointed a committee to take up the matter of standardization with Department of Agriculture authorities. The committee which consists of four members is headed by E. J. Gittens, vice-president of the J. I. Case T. M. Co., other members being J. B. Bartholomew, president of the Avery Co.; Finley P. Mount, president Advance-Rumely Thresher Co.; G. J. Alexander, vice-president and treasurer Aultman-Taylor Machinery Co. The committee has not met as yet nor has it formulated any plan of procedure. However the matter has been placed before the Department of Agriculture, which had its representatives at a meeting of the Tractor Division of the N. I. V. A. two weeks ago.